

# AUTOMOTIVE INDUSTRIES

Volume 60  
Number 25

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS  
PHILADELPHIA, JUNE 22, 1929

35c a copy  
\$3.00 a year

## CARS THAT STAY YOUNG



CROSSES INDICATE "TIMKEN-EQUIPPED" POINTS

MAKE	MODEL	Front Wheels	Rear Wheels	Pinion	Steering Differ- ential
Auburn.....	All	x	x	x	x
Cadillac.....	All	x	x	x	x
Chrysler.....	De Soto Plymouth 65 & 75 Imperial	x	x	x	x
Cunningham....	All	x	x	x	x
Dodge.....	All	x	x	x	x
Durant.....	40, 60, 66 70	x	x	x	x
Elcar.....	75 95, 96, 120	x	x	x	x
Ford.....	All	x	x	x	x
Franklin.....	All	x	x	x	x
Gardner.....	All	x	x	x	x
Graham-Paige..	612 615	x	x	x	x
Hudson and Essex	621, 827, 837 All	x	x	x	x
Hupmobile.....	Century 6 Century 8	x	x	x	x
Jordan.....	All	x	x	x	x
Kissel.....	75 & 95 126	x	x	x	x
Kleiber.....	All	x	x	x	x
LaSalle.....	All	x	x	x	x
Lincoln.....	86 & 88	x	x	x	x
Locomobile.....	68 78	x	x	x	x
Marmon.....	Roosevelt	x	x	x	x
McFarlan.....	All	x	x	x	x
Moon.....	All	x	x	x	x
Nash.....	Std 6	x	x	x	x
Peerless.....	All	x	x	x	x
Pierce-Arrow....	All	x	x	x	x
Reo Flying Cloud	The Master Flying Cloud	x	x	x	x
Roamer.....	6-80 8-90	x	x	x	x
Stearns-Knight..	All	x	x	x	x
Studebaker and Erskine....	All	x	x	x	x
Stutz.....	All	x	x	x	x
Willis-Knight and Whippet....	All	x	x	x	x



**AWAY** on motor-wings, going places, doing things . . . years of miles go by . . . what of it?

Youth perennial abides in cars Timken-equipped. The threat of thrust, speed, shock and torque is safely entrusted to this age-defying combination—Timken tapered construction, Timken **POSITIVELY ALIGNED ROLLS** and Timken-made steel.

The list on this page tells the story of car-life and youth. Car buyers decide by it, dealers stress it.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

# TIMKEN Tapered Roller BEARINGS



## FACTORY SERVICE MANAGERS!

### Get the Facts on the New DITZLER INTERMIX COLORS

**W**ITH the sixteen standard shades of the new Ditzler Intermix Colors, an unlimited range of colors for repaint and touch-up work can be prepared by your dealers. Hundreds of new production shades are possible with this new method; any shade can be duplicated accurately and easily, time after time, in any quantity.

The Ditzler system is simple, practical, and scientifically exact. Tested formulas are supplied the dealer, to assist him in preparing any color that he may need. Owners are given faster and more satisfactory service; stock requirements are reduced to a minimum; and dealers cease

to trouble you with their repaint problems!

Each of the 16 shades in the Ditzler Intermix Color series is made to the same standard of quality which governs the manufacture of Ditzler factory production colors. These are supplied regularly to such firms as Briggs Body, Budd Wheel, Dodge, Elcar, Gardner, Graham-Paige, Hudson, Jordan, Lincoln, Packard, Reo and Studebaker.

Seventy conveniently located Ditzler distributors are ready to cooperate with your dealers. Write today for full information on this new and thoroughly dependable Ditzler Service. It will solve one of your most important problems.

# DITZ-LAC

(PYROXYLIN)

DITZLER COLOR COMPANY DETROIT, MICHIGAN



# AUTOMOTIVE INDUSTRIES

## AUTOMOBILE

Reg. U. S. Pat. Off.  
Established 1903

Vol. 60

No. 25

NORMAN G. SHIDLE, Directing Editor  
HAROLD M. BAKER, News Editor  
P. M. HELDT, Engineering Editor  
K. W. STILLMAN, Asst. Editor  
HAROLD E. HILLMANN, Asst. Editor  
EARL O. EWAN, Managing Editor  
ATHEL F. DENHAM, Field Editor  
M. WARREN BAKER, Field Editor  
LEWIS C. DIBBLE, Detroit News Rep.  
A. B. CROFOOT, N. Y. News Rep.

## Contents

Mid-Year Outlook Indicates Keener Competition Ahead, By Earl O. Ewan .....	935
Aluminum Alloy Bodies for Trucks Possess an Economic Advantage, By P. M. Heldt .....	938
Plymouth Speeds Material Movement With Automatic Conveyor Handling, By Athel F. Denham .....	940
Tractor Gears and Pinions Milled Automatically in One Operation .....	943
New Body Designs May Be Derived From Lowness of Front Drive Cars .....	944
Nickel and Chromium Alloy Effects Carbon Balance in Cast Iron .....	946
Just Among Ourselves .....	949
Books for the Business Bookshelf .....	950
Tungsten Carbide Cutting Edges Renewed by Lapping Operation, By S. M. Hershey ....	951
Multi-Wheeled Traction Trucks Tested in Army Demonstration, By James W. Cottrell.....	952
Economical Reduction of Lean Ores Credited to Smith Process .....	954
New Developments .....	956
News of the Industry .....	960
Men of the Industry .....	966
Financial Notes .....	967
Calendar of Events .....	970
Advertisers' Index .....	104, 105

Automotive Industries is published every Saturday by  
**CHILTON CLASS JOURNAL COMPANY**  
Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager  
J. S. HILDBRETH, Vice-Pres. and Director of Sales  
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.  
A. H. VAUX, Secretary and Treasurer  
JOHN A. CLEMENTS, Asst. Treasurer

JULIAN CHASE, Business Manager  
Automotive Industries  
Cable Address.....Autoland, Philadelphia  
Telephone.....Sherwood 1424

### OFFICES

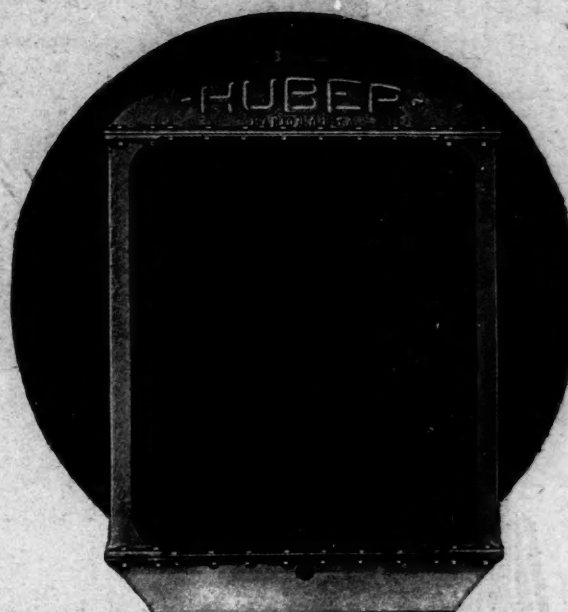
New York—U. P. C. Bldg., 239 W. 39th St., Phone Pennsylvania 0080  
Chicago—5 South Wabash Ave., Phone Central 7045  
Detroit—710 Stephenson Bldg., Phone Northway 3090  
Cleveland—1140 Guardian Bldg., Phone Main 6860  
Los Angeles—433 Petroleum Securities Bldg., Phone Westmore 9084

Controlled by United Business Publishers, Inc., 239 West 39th Street, New York;  
ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

**SUBSCRIPTION RATES:** United States, Mexico, United States Possessions, Canada and all countries in Postal Union, \$3.00 per year; Foreign, \$4.00 per year. Single Copies 35c.

COPYRIGHT, 1929, CHILTON CLASS JOURNAL COMPANY  
Member of the Audit Bureau of Circulations  
Member Associated Business Papers, Inc.

Automotive Industries — The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1903; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.



**HUBER TRACTORS**—an old name in the power farm machinery industry—one that has always stood for reliability. The new Huber is equipped with a Young Radiator, built complete in the Young plant and designed by Young engineers to specifications set down by Huber for efficiency and performance. And again appearance counts—it pays to have a cleaner looking and stronger radiator, and at a saving.

Young production engineers and designers function as part of your own organization on our payroll, working for your best interests. If it's Young engineered it's right, and you are the judge. It will pay you to investigate. Write us your problems now.

*Fine quality radiators for coaches, trucks, tractors, power units, and all types of cooling installations; backed by a guarantee of satisfaction.*

## Young Radiators

**YOUNG RADIATOR COMPANY**  
Racine Wisconsin

Pacific Coast Representative  
**S. CLYDE KYLE**

Rialto Building

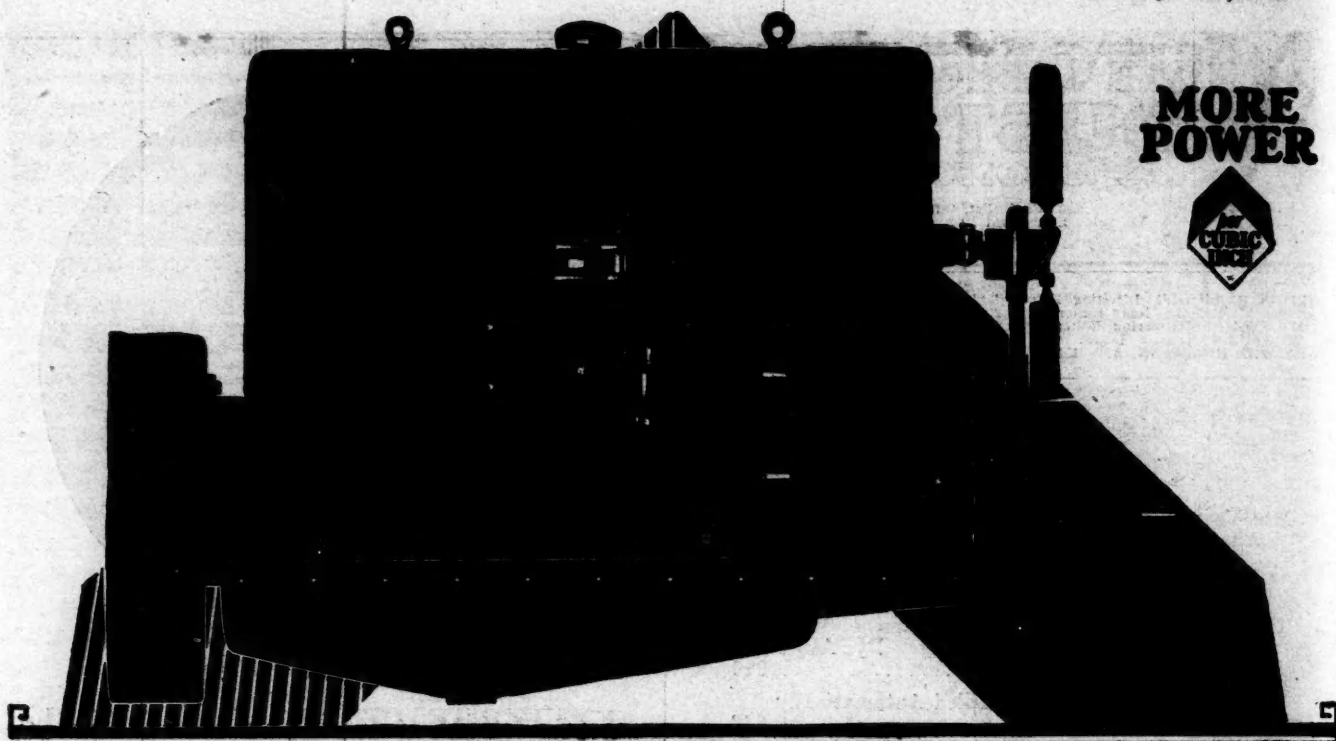
San Francisco



© Y. R. Co.

Reg. U. S. Pat. Off.

**YOUNG RADIATORS ARE USED WHERE THE GOING IS TOUGH**



## Consistent Performers

**W**ISCONSIN MOTORS are not temperamental "prima donnas"—marvels of power today and finicky non-performers tomorrow. They're consistently good—all the time. A positive, bed-rock solidity about Wisconsin Motors assures dependable performance even in overload service. They handle any job without quibbling or quitting.

The satisfaction given by any power-driven equipment naturally depends, to a great extent, upon the performance of the power unit. And that is the one best argument in favor of Wisconsin Motors.

Built in a full range of Sixes and Fours, from 20 to 150 H.P., for trucks, buses, tractors and industrial machinery.

WISCONSIN MOTOR CO.  
MILWAUKEE  
WISCONSIN

*Wisconsin*  
CONSISTENT



## Mid-Year Outlook Indicates Keener Competition Ahead

*More intensive marketing predicted to follow the introduction soon of additional new models. Tapering production is considered seasonal. Car stocks decline.*

By EARL O. EWAN

**R**ECESION of automotive output schedules from the 1929 production peak recorded in April and May is being accepted as the natural trend by executives of the industry, most of whom are not projecting from their background of all-time manufacturing and sales records established thus far this year a pessimistic outlook upon the last half of the year, at the threshold of which they are standing.

"It always has tapered!" laconically declared the general sales manager of a company that turns out one of the very popular lower-priced cars, in speaking of the current production decline. He, as well as several other officials of the industry visited in Detroit within the last few days, deprecated the emphasis that had been placed upon the receding output by certain of the public prints.

"Some of them talk as if it never had happened before," said one executive whose statement expressed the consensus of a number of others.

"Conservative," however, is the term that best describes the general attitude of the executives interviewed toward what the last six months of 1929 will mean to the makers and marketers of automobiles, and to contributing industries. None of them could be induced to pose as prophet. All of them logically qualified their statements concerning the subject, either expressly or by implication, by indicating that the many factors which affect the status of the automotive industry limit the possibilities of accurate, long range forecasting about it almost exclusively to the realm of the inspired oracle.

These executives pointed out the now widely-acknowledged interdependence of industries, and instances where various economic influences have been reflected definitely in the automotive field. A 10 per cent

lowering of the potential sales volume of a well-known car in the higher price class was attributed by the general sales manager to the recent stock market slump resulting from the action of the Federal Reserve Board. Another general sales manager whose product is in the same price class said his sales and order cancellation figures never were long in registering a pronounced fall in the stock market. The depression in wheat prices was credited with causing a certain loss in automobile sales.

The recent settlement of the reparations question in Europe, most of the executives believe, will lessen the financial stringency that has been noticeable there, and thereby increase the export sales of automobiles.

Financing of the settlement, it was said, would stimulate the circulation of money, cultivate public confidence and thus create additional credit. Export sales for the first four months of the year totaled 162,366 cars as against 121,292 for those months in 1928 and 110,710 for that period in 1927. These figures do not include all foreign assembly cars.

All the executives seen expressed pleasure at the tapering off of car stocks, both new and used, reported since summer weather superseded that of the inclement spring. They did not foresee anything that would interfere with the rise of sales figures until possibly the seasonal retardation next fall.

Sales for the first five months of 1929 were 42 per cent greater than those tabulated for the same period of the record year of 1928. This unprecedented prosperity, however, that thus far this year has marked the course of the automotive industry has not been distributed evenly. This is not a phenomenal circumstance, of course, but one that always has characterized the





flourishing seasons of the industry. This year, manufacturers in the lower price class have fared well with but few exceptions. More unevenness in the prosperity scale is evident in the higher price ranges.

Numerically, sales for the first five months of 1929 totaled 1,825,000 cars as compared with the aggregate of 1,280,000 cars for those months in both 1928 and 1927. The total of new car stocks as of June 1 has been estimated on the basis of production and registration figures as around 235,000 more cars than were on hand last Jan. 1. On June 1, 1928, there were on hand 150,000 more cars than in the total stocks of Jan. 1, 1928. That shows an increase of 60 per cent this year in total new car stocks as of June 1 over the 1928 aggregate for that date, which, in turn, was 68 per cent greater than that for the same date in 1927.

#### Lower Priced Car Sales Gain

Computing the total passenger car production for this month at 490,000 units, and using the estimate of May production, 540,000 cars, makes production by the United States and Canada for the first six months of 1929 aggregate 2,950,000 cars as compared with 2,073,849 in that period of 1928 and 1,913,524 in the first half of 1927.

This production gain in 1929 has been confined to the lower price field of cars selling at wholesale for \$750 and less, judging from a calculation based on production figures for the first four months of this year. The percentage of gain over 1928 in the lower price class for the four months was 74 as compared with a decline of 12 per cent in the price class selling at wholesale from \$751 to \$1,000, a decrease of 1 per cent in the class selling at wholesale from \$1,001 to \$1,500 and of 8 per cent in the class selling at wholesale from \$1,501 and up.

Further calculation shows that production for the first four months of 1928 in the first named class was 69.8 per cent of the entire output as compared with 81.2 per cent in 1929; in the second price class, 14 per cent in 1928 as against 8.2 per cent in 1929; in the third price class, 11.2 per cent in 1928 as against 7.5 per cent in 1929, and in the fourth price class, 5 per cent in 1928 as against 3.1 per cent in 1929.

Estimates of the total production for 1929 have ranged from as low as 4,750,000 to as high as 5,350,000, and a number of executives have voiced the assurance that the final figure for the year will be 5,000,000 cars

or more. These officials think that only an economic depression of exceptional proportions can prevent the automotive industry from registering the highest records in its history in 1929.

The present tapering off in production is due partly to preparations being made by manufacturers to introduce new models. In such instances, efforts are being exerted to clear out the stocks of present models before the new cars are announced. Five new cars have been announced since the Chicago show in January—the Viking, the Roosevelt, the Marquette, the Ruxton and the new Studebaker Dictator. Other announcements are scheduled for the next few weeks. These automobiles will lead in a procession of new cars that will stream from the various assembly lines in increasing numbers and set the style and mechanical trends for the first half of 1929.

Mechanically, probably the most notable innovation of the next six months will be the production of front-wheel drive cars. The Ruxton has been announced, and the debut of another front-wheel drive automobile has been scheduled. The latter will be made by one of the established companies in the industry, while the former is to be manufactured by the New Era Motors, Inc., at the Gardner plant in St. Louis and in an as yet unannounced plant in Cleveland. Entry of the front-wheel drive automobile into the stock car field will be watched with considerable interest by all executives in the industry. Rumors concerning the possibilities of 12 and 16-cylinder cars being introduced are not expected to materialize within the next six months.

#### Front Drive Permits Body Changes

Probably the most outstanding changes in body design in the next six months will be seen on the new front-wheel drive cars, since their chassis construction permits the use of a different body from those adapted to the conventional rear-drive automobile. Recent unfortunate experiences of certain automobile manufacturers in endeavoring to popularize unusual body designs have made executives wary about any change in that feature of a car. They all realize, however, the extreme importance of car appearance as a major sales factor.

Fall business is expected to be stimulated for any manufacturer who introduces a new model. In fact, several sales authorities were of the opinion that the

(Continued on page 948)

### Passenger Car Output in the United States and Canada for the First Six Months of 1927, 1928, 1929

1927	United States	Canada	Total	1928	United States	Canada	Total
January	199,650	11,745	211,395	January	205,646	6,705	212,351
February	264,171	141,826	278,997	February	291,151	10,315	301,466
March	346,031	19,723	365,754	March	371,821	15,227	387,048
April	358,682	20,890	379,572	April	364,877	20,517	385,394
May	358,725	21,991	380,716	May	375,863	29,764	405,627
June	280,620	16,470	297,090	June	356,622	25,341	381,963
Total	1,807,879	105,645	1,913,524	Total	1,965,980	107,869	2,073,849

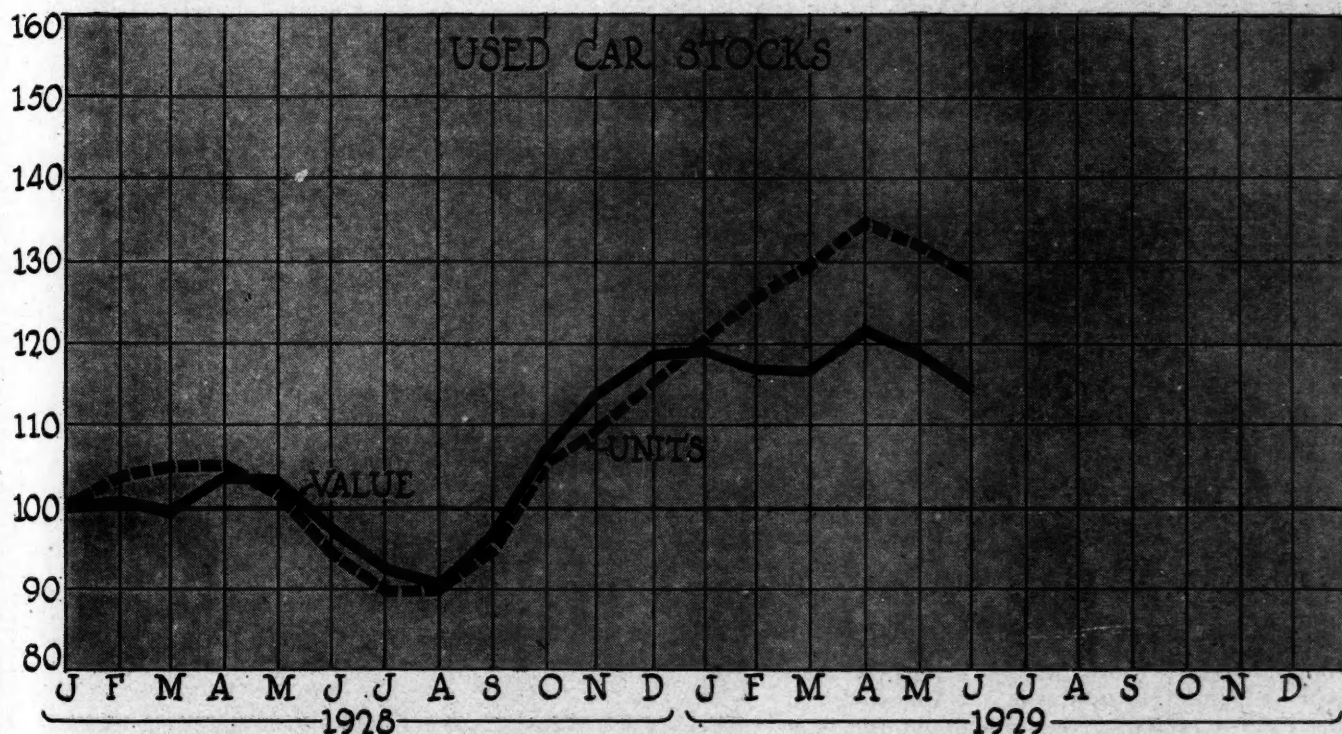
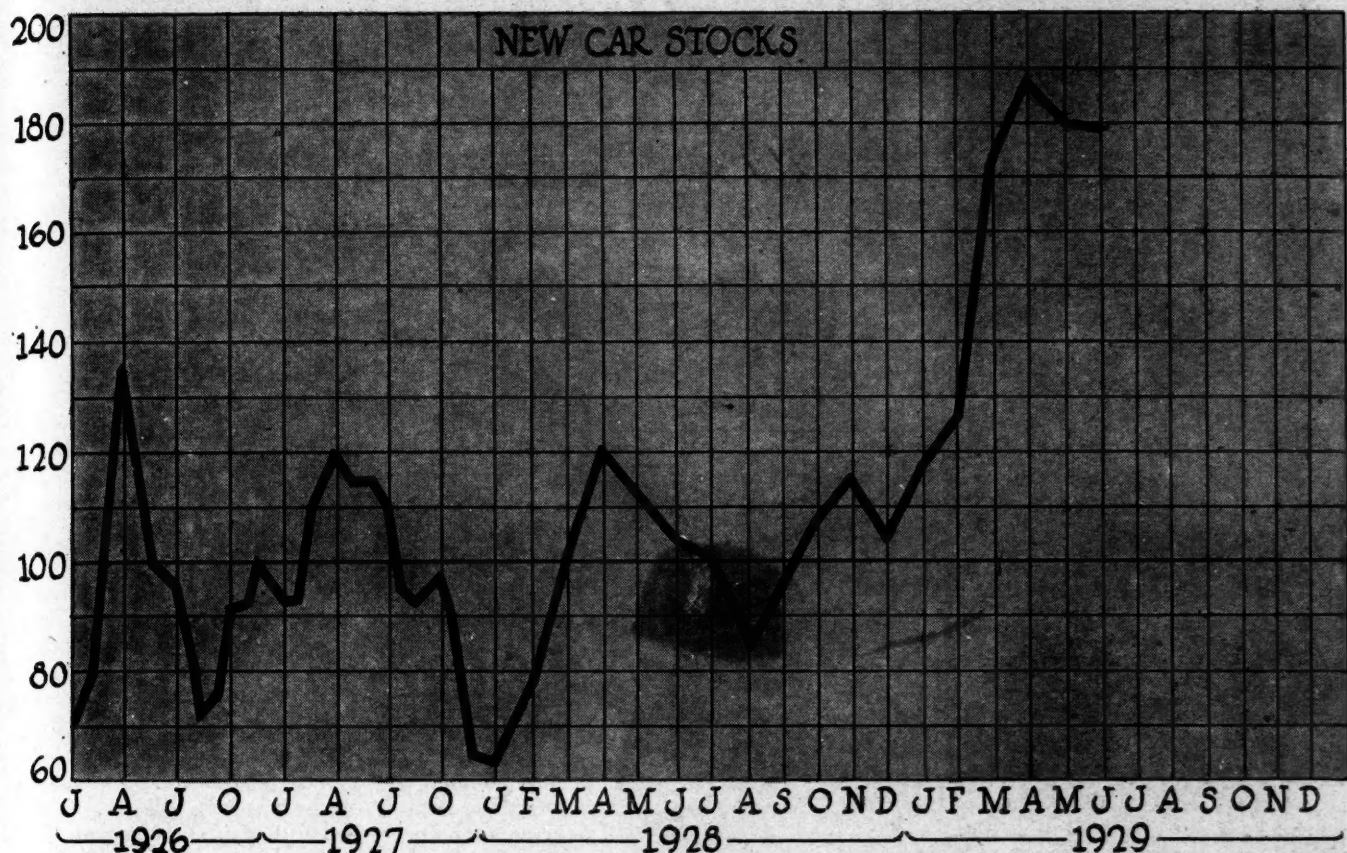
  

1929	United States	Canada	Total
January	347,382	17,164	364,546
February	405,708	25,584	431,292
March	513,266	32,833	546,099
April	537,225	34,392	571,617
May	*540,000	.....	540,000
June	*490,000	.....	490,000
Total	2,833,581	109,973	2,943,554

\* Estimated passenger car production for the United States and Canada.



# DEALER STOCKS OF NEW AND USED CARS DECLINE



Above—New car stocks showed less tapering off in May than in April. The index is based on new cars in dealers' hands and in transit on the first of each month. The 1927 monthly average stock equals 100

Below—Used car stocks continued in May the recession begun at the opening of April, both in units and in value, as is shown by the two lines on the chart. This report on used car stocks is based on reports received from hundreds of representative dealers located in all parts of the United States. Used car stocks as of Jan. 1, 1928, equal 100

Both charts are reproduced herewith through the courtesy of AUTOMOBILE TRADE JOURNAL AND MOTOR AGE, which publishes them monthly. This is the only report of its kind published by any periodical edited for the automotive retailer

# Aluminum Alloy Bodies for Trucks Possess an Economic Advantage

*Their use has been largely credited to the incentive for overcoming legal restrictions imposed upon gross weight of vehicles using highways*

By P. M. HELDT

**S**INCE 1926, truck and trailer bodies in limited numbers have been built of aluminum alloy shapes and sheets. The practice seems to have proved economically justified and is growing. So far, most of the bodies

the chassis usual with conventional truck bodies.

The problem concerning the economic advantage of aluminum bodies is a comparatively simple one, although one of the factors involved—the life of these bodies—naturally is not definitely known as yet. If a given truck with a conventional body is capable of carrying a pay load  $W$  lb. and the substitution of an aluminum body permits of a saving in truck weight (and, consequently, of a gain in pay load) equal to  $w$  lb., then as much load can be transported in  $W/w$  trips with the aluminum body as in  $(W/w) + 1$  trips with the ordinary body. Looking at the matter in a different way, one day in  $(W/w) + 1$  can be saved by the lighter body.

Motor truck users who keep account of their operating costs know exactly how much it costs them to operate their trucks per day. For instance, if the lighter body saves one day in ten and 300 working days per year are figured on, then the saving on operating costs per year is



Above—This dump body of  $3\frac{1}{2}$  cu. yd. capacity was made by the Auto Truck Equipment Co. of Pittsburgh for the Aluminum Co. of America. One-half of the floor is made of sheet aluminum and the other of sheet steel

that have been built of aluminum have been for very heavy loads, five tons and over, in connection with which there is a very sizeable gain in respect to lightness. It appears that the chief incentive to use aluminum for this purpose has been the legal restrictions which most of the states impose on the gross weight of vehicles using the public highways. In many cases, owners of large trucks feel that these vehicles could be made to carry heavier loads safely if it were not for the legal restrictions. By lightening the bodies, not only is it possible to carry additional loads legally, but this can be done without increasing the wear and tear on



This high-lift coal dump truck with body and hoisting cylinder made of aluminum was produced with a saving of 1800 lb. in the weight of the truck. The body capacity was increased from 6 to 7 cu. yd.





The body of this truck, with the exception of the floor, is built of aluminum alloy. The inside dimensions are 144 x 66 x 15 in. with 15-in. flares, and the saving in weight is 800 lb.

evidently equal to 30 times the daily operating cost—provided, of course, there is sufficient work to do for the truck with the aluminum body and its increased load capacity.

The aluminum body costs more than the steel or composite body, and hence two items in the schedule of truck operating expenses are apparently increased; namely, the interest on investment and the depreciation. How much more the aluminum body costs in the first place is subject to pretty close calculation, and the increased interest on the investment, therefore, is also quite definite. But whether the depreciation is increased, and how much, is not so easily determined. The average annual depreciation of the body is equal to the difference between its first cost and its junk value divided by the number of years of its life. The first cost, as already pointed out, is materially greater in the case of the aluminum body, but the junk value also is much greater, and considering this and the fact that aluminum bodies—in most services at least—are not subject to deterioration from corrosion, the average annual depreciation of the aluminum body may not be materially greater than that of the ordinary truck body.

Details of weights and costs of five different designs of aluminum alloy truck bodies and comparative figures for the steel bodies they replaced are given in the following table:

No.	Dimensions	Wt. Steel	Wt. Al.	Wt. Saved	Cost Steel	Cost Al.	Increased Cost	Cost per lb. of wt. saved
A	144 x 72 x 16	1900	800	1100	\$275	\$500	\$225	20.5
B	146 x 66 x 15.6	1400	610	790	225	425	200	25.0
C	84 x 54 x 12.6	750	470	280	105	175	70	23.3
D	144 x 82 x 30.7	3025	1625	1400	450	750	300	21.4
E	108 x 74 x 30.7	4600	2800	1800	1000	1645	645	35.8

The average increase in cost of these five bodies is about 25 cents per pound of weight saved, which is equivalent to \$500 per ton saved. Since with heavy trucks the operating costs usually are in the neighbor-

hood of 10 cents per useful ton-mile, the gain in capacity would pay for the additional first cost in 5000 miles under full load, corresponding to about 10,000 miles total running, which is not much more than the average yearly mileage of a heavy truck in a service where it is needed constantly. Thus from this point of view, and granting that the assumed figures are correct, the use of aluminum bodies is highly profitable.

Following is an analysis of the possible savings in an actual case, that of a Chicago coal company which owns a number of 7½-ton trucks. On the level streets of Chicago these trucks are being overloaded to the extent of nearly 50 per cent.

Estimated weight-saving in body and hoist by using aluminum, available as additional pay load	2,000 lb.
Trips per day (31.1 miles)	10
Average pay load per trip, steel body	22,000 lb.
Days required to gain one day's work of steel body	11
Days work gained per year (285 days)	25.9
Operating cost per truck per day	\$20.43
Cost of 25.9 days saved per truck per year	\$529.14
Added investment for aluminum body and hoist	\$700.00

While the main advantage of the lighter weight body is that it permits of an increase in pay load without additional operating costs (except that resulting from the higher first cost of the body), there are other advantages in the use of aluminum for truck bodies. This body, of course, does not have to be painted at the start, but this advantage is already included in the figure given for the cost difference. Most other bodies, however, must be repainted occasionally to preserve them from rapid deterioration, which is not as great with the aluminum body.

If, instead of the additional pay-load capacity due to the lighter weight of the aluminum body being fully utilized, the truck is operated with the same pay-load, then the fuel consumption and the wear and tear on the chassis will be less. This, of course, is not an additional advantage, but a different way of realizing the advantage of the lighter weight of the aluminum body. With less gross weight there will be less gear shifting, and

(Continued on page 945)

# Plymouth Speeds Material Movement With Automatic Conveyor Handling

*Efficient location of departments aids coordination along  
30,000 ft. of transfer system in redesigned  
plant of Chrysler Corp.*

By ATHEL F. DENHAM

**C**OMpletely redesigned, considerably expanded and new in every respect since its occupation by the Plymouth Motor Corp., the Mt. Elliott and Lynch Road plant of the Chrysler Corp. represents the latest word in modern production methods, especially in regards to the methods of automatic material handling installed.

Interdepartmental handling of materials is done by means of a number of major conveyor systems, with many feeder lines used for carrying partially completed or completed minor parts between major assembly movements, or for keeping constant the general assembly progression. Accompanying this article is shown a plan drawing of the major system of conveyors (Fig. 1). The secondary lines were omitted from the drawing for the sake of clarity.

The assembly of the car starts at the west end of the half mile long plant, and continues to the eastern

end, with various sub-assemblies located south of the two final assembly lines, as closely adjacent to the point of assembly of the parts into the car as possible. The same layout plan has been carried out in the sub-assemblies themselves, as may be noted from the allocation of departments (Fig. 1) around the motor assembly line. As a rule, therefore, there is very little back-tracking of materials.

In spite of the efficient allocation of departments to reduce the distance of travel of each part in the process of its manufacture and assembly, there are some 30,000 ft. of conveyor in the plant for further reducing manual handling to the absolute minimum.

Of course, certain parts have to be transferred back and forth from one department to another to avoid duplication of operations, where there is no gain from such duplication. Thus brake shoes are enameled in the same automatic installation as the body sheet metal, and then have to be transported back to the brake depart-

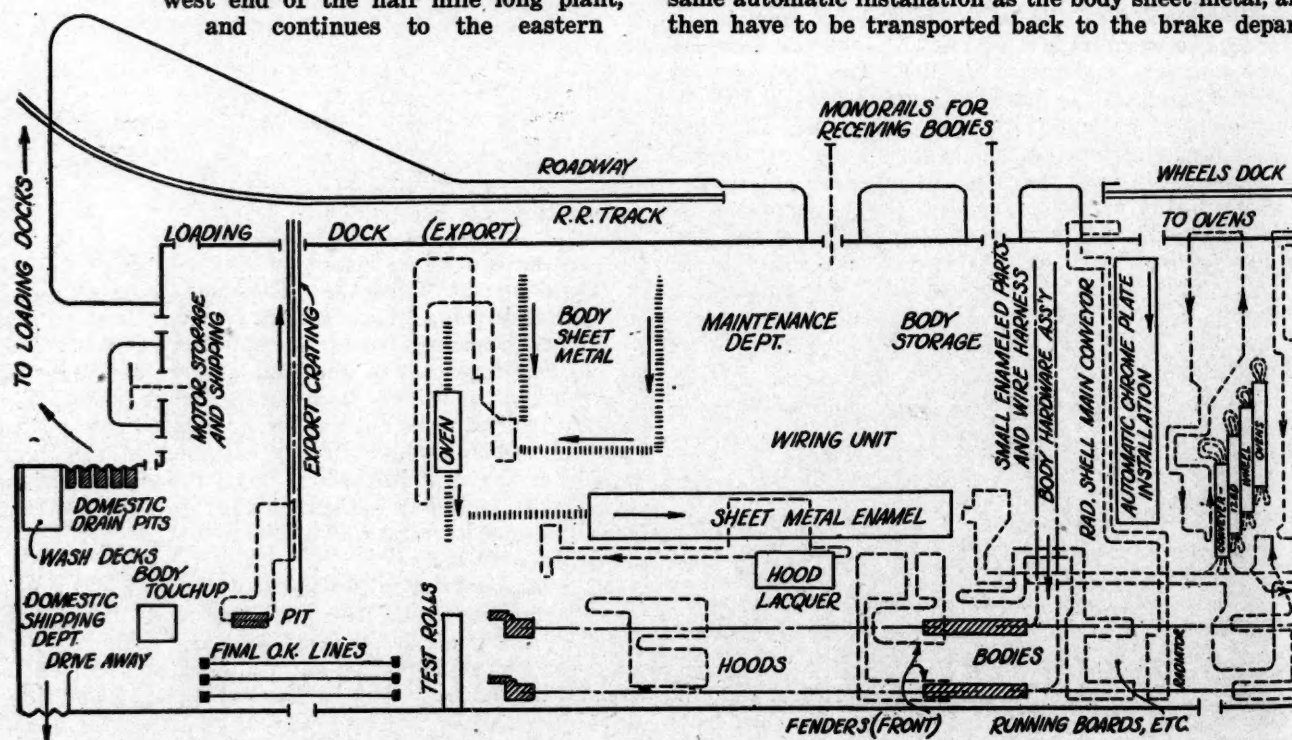


Fig. 1—Layout of the main interdepartmental conveyors in the plant of the Plymouth Motor Car Co. end. All manufacturing operations start at the east end and work west to this line, and from the so shown on



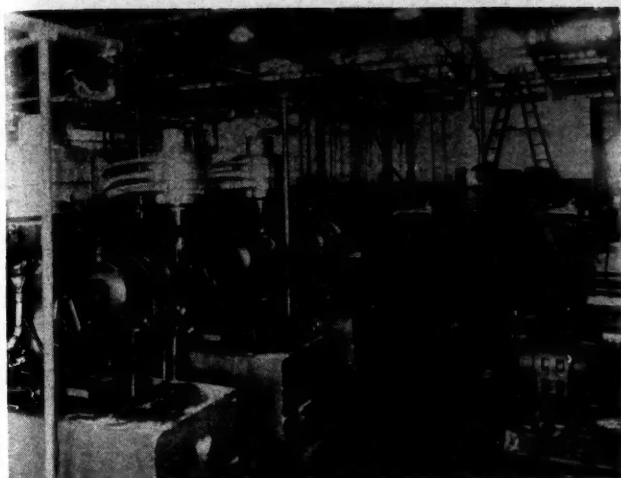


Fig. 2—The Plymouth Motor Car Co. gives every engine both a block and a dynamometer test. The above view shows in the background the dynamometer rooms, through which the conveyor shown in the center passes

ment at the west end of the plant by means of a conveyor.

As far as possible, within the Plymouth plant, the overhead chain type of conveyor is used. This applies not only to the transfer of such parts as can with facility be hung on hooks, but also to larger parts, such as frames and axles, for which special cradles have been designed. In taking axles to the assembly line, only a single conveyor is needed. This conveyor is fitted with double cradles in each of which a pair of axles, one front and one rear, are placed, and is operated over the final assemblies of both front and rear axles.

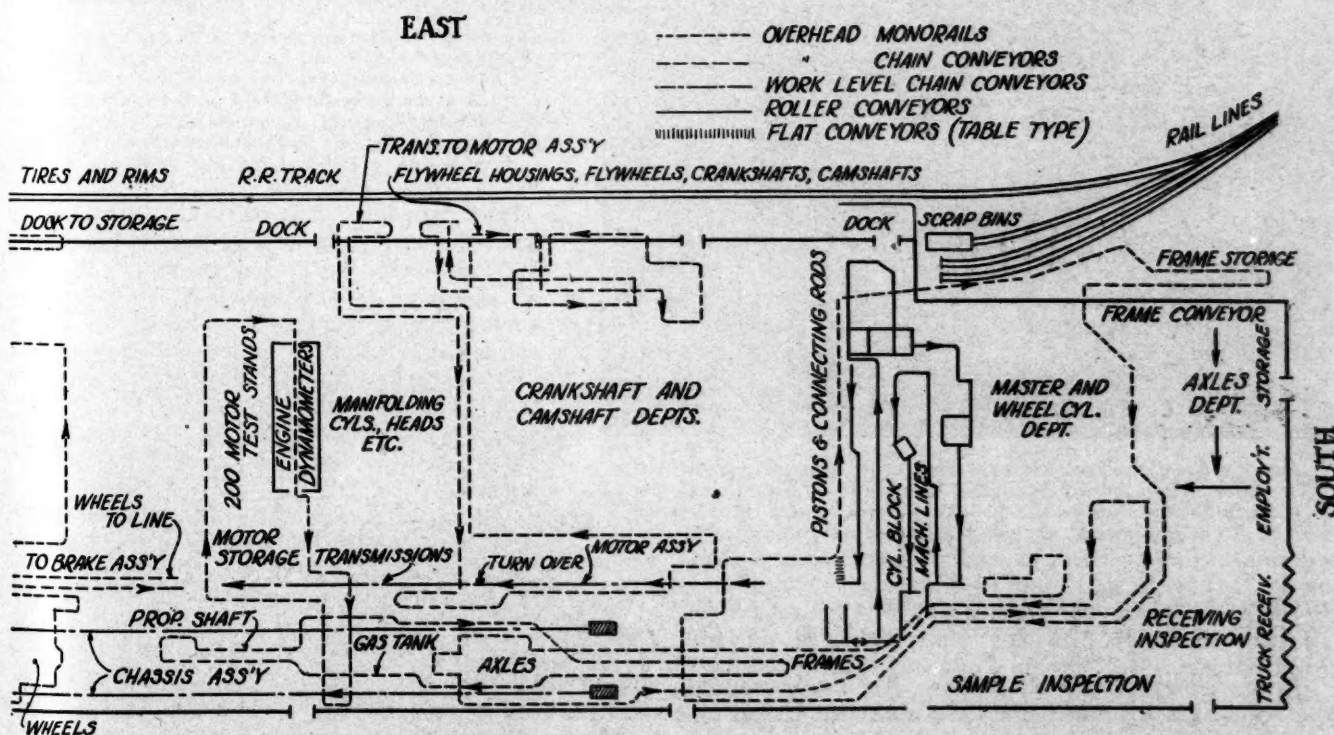
For the assembly of the major car parts, work-level type chain conveyors are used, sometimes flanked (as in the case of the export crating department) by two roller

conveyors, one on either side, to carry the load, the chain furnishing only the propulsion. The main engine conveyor unit is slightly elevated from the floor for the major part of its travel from the engine assembly line, around the running-in stands, and through the dynamometer rooms. Approaching the chassis assembly line, the conveyor rises above the lines, to facilitate dropping the engine into the chassis from elevated platforms by means of electric operated hoists.

Other types of conveyors, which are not suspended from the roof girders, include the table type, handling the body sheet metal between finishing operations and through the cleaning ovens. The advantage of this conveyor is that it has a greater carrying capacity, permits a lower type of cleaning oven than is possible with an overhead chain conveyor, reduces chances of damage to



Fig. 3—Conveyors are used for export crating and the delivery of the crates to the freight car. The central chain only serves to push the crate by means of the "hooks" shown. The rolls at either side take the load



The two chassis assembly lines, running from right to left, will be noted near the bottom or west end of the plant north or left. Departmental conveyors, numerous in this plant, are not shown in this drawing

the sheet metal and makes for easier loading and unloading of these bulky parts.

Overhead monorails are of two types, those fitted only with movable compressed air hoists, such as are used for the unloading of bodies from trucks at the dock, etc., and those equipped with electrically operated overhead transfer trolleys, such as are used in transferring the bodies from the body hardware assembly line to the final assembly lines. One advantage in the last named operation is the greater flexibility it permits over the usual method of dropping the body through a hatch, since a greater length of the final assembly lines is available for the body mounting operation.

Roller conveyors are used to a somewhat lesser extent than in the average plant, but form a major factor in the cylinder block machining line, where the machining operations are tailored into the line in such a manner as to eliminate practically all lifting of the blocks for the loading of machine tools. Wherever possible, however, the roller conveyors are replaced by overhead chain types. This is particularly true of the radiator shell division, which is completely conveyorized, taking the shells from operation to operation from the automatic plating installation to the main assembly line. The effect of the network of chain conveyors on the buffing department is quite important, since it permits greater flexibility in the total

at the plant on time for regular assembly work.

The handling of axles, which form the next assembly to go to the final assembly line, already has been described. It might be mentioned that the brake department is located adjacent to the axle department to reduce interdepartmental handling. The brakes themselves are assembled in fixture on annular rotating tables, each man performing a set operation on the assembly. The minor parts going into the brake assembly are found either on the rotating table, or on a stationary inner table directly opposite the operator responsible for their assembly into the unit. Considerable saving of floor space and better control over the individual operator's production quantities are realized through this and similar installations found in the plant.



*Fig. 4—Electrically operated hoists with automatic stops are used for heavy work throughout the plant. This view shows a body being transferred to the line on which the wiring harness, etc., is assembled into it*

number of buffing machines in operation at one time without affecting the handling materials in the slightest.

Taking some of the parts individually, it is noted that the frame conveyor delivers the assembled frames directly from the rail receiving dock to the chassis assembly line, passing through the frame storage where an emergency bank is kept. As a rule this bank of frames is not used, except when a shipment fails to arrive



*Fig. 5—From the line referred to in Fig. 4, bodies are transferred to the final assembly by overhead traveling tramways, as shown in this view. This method gives more flexibility to the final assembly line, as to the point of mounting the body, than does the more usual method of dropping the body through a hatch from the floor above*

The cylinder block machining line begins near the receiving dock on which the blocks are unloaded. Working back and forth, with all operation points connected by roller conveyors, the end of the machining line leaves the block at the head of the engine assembly line. Next, to the east of the block line, are the piston and connecting rod machining operations. Piston machining operation points are connected by sloping racks, down which the pistons roll.

Next in order are the crankshaft and camshaft machining departments, also completely conveyorized, chiefly with overhead conveyors.

The same conveyor which delivers crankshafts and camshafts to the line from the receiving dock also carries flywheel housings and flywheels to their respective machining departments. Transmissions are delivered directly from the receiving dock to the motor assembly line.

Machining departments for manifolding and cylinder heads, etc., are located between the transmission conveyor and the engine final test department, and are ad-

(Continued on page 955)



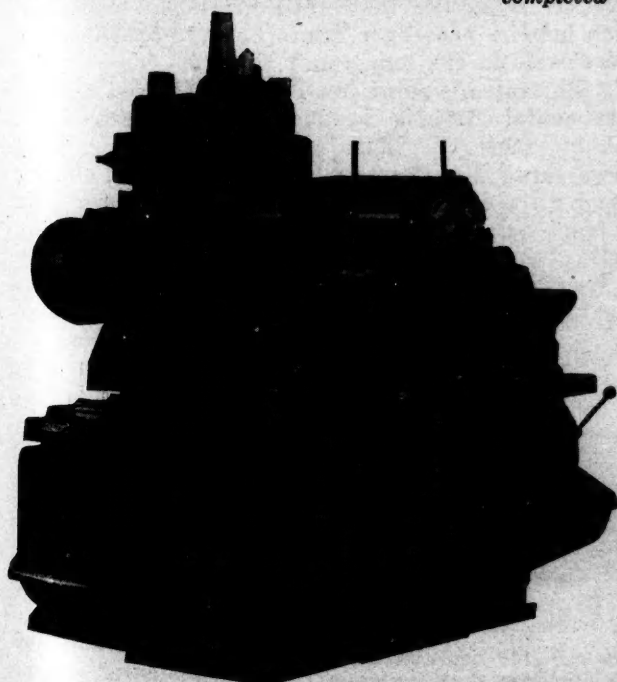
# Tractor Gears and Pinions Milled Automatically in One Operation

*Special adaptation of Mil-Waukee-Mil increases production from 50 to 100 per cent in rough milling of teeth.*

THE Kearney & Trecker Corp., Milwaukee, has recently developed a special adaptation of its No. 1404 Mil-Waukee-Mil Simplex on which increased production ranging from 50 to 100 per cent is being obtained in the rough milling of teeth in differential gears and pinions for a farm tractor.

The machine has a capacity for 18 gears and 40 pinions per hour. Three 4-5 DP, high carbon, 28 tooth gears and four 14 tooth pinions are milled simultaneously, the cutting time for a gear tooth being 17 sec. and that for a pinion tooth 16 sec. While the machine was designed especially for this particular job, it can be adapted for work on gears and pinions with a different number of teeth or different pitch diameters by the use of other fixtures.

The entire operation, with the exception of the loading of the indexing spindles, is automatic. The machine is equipped with a two-spindle, horizontal head and two opposed, independently controlled, cam-operated tables. Each table carries an automatic indexing fixture, one having three spindles for the gears and the other four for the pinions.



General view of K&T special milling machine

There are two cutter arbors, the one on the gear side carrying three high speed bevel gear roughing cutters and the one on the other side carrying four similar cutters for the pinions. The arbor spindles are mounted on Timken bearings with the outer support bearings being made so



Gear and pinion blanks and parts completed in K & T Machine

Detail view of worktables and work

that they can be slipped off the arbor without disturbing either the overarm or the front arm brace.

Both the center and end bearing supports are mounted in guides so that they can be moved vertically to correct for cutter wear. The arbors are fitted

with sleeves which hold the cutters to lateral adjustment and facilitate their removal and replacement. The cutters revolve in opposite directions turning against the feed.

The tables are independently controlled by drum cams. Cams, rollers and levers of the indexing mechanism are made of hardened steel and work spindles are mounted in Timken bearings. Each work spindle is automatically locked in the index while in cut. A single motor drives the arbors, work tables and indexing mechanism through a series of gear reduction units.

In operation, a gear blank is placed on each of the three spindles and tightened. An automatic spindle lock prevents the spindle from getting out of place during loading. After loading the operator trips the starting lever, the work is carried rapidly to the cutters, slowly through the cut and the table then reverses and returns quickly to the starting point. During the reverse travel the work is automatically indexed and the cycle continued until the blank has been indexed around its circumference. Operations on the pinions take place simultaneously with those on the gears.

# New Body Designs May Be Derived From Lowness of Front Drive Cars

*Manufacturer turning out vehicles of new and old type of drive may use the former as a "proving ground" for ideas in line treatment.*

**T**HERE is one thing which the front drive car, aside from any mechanical merits, can provide the automobile industry, and that is something new in body design. Whether or not it will actually do so, of course, is only for the future and the individual manufacturer to determine." Thus E. T. Pearsons, body designer of the Baker-Raulang Company, summarized the body man's attitude toward the front drive car. Continuing, he said:

"The present automobile as a mechanism, is basically so well standardized that the success or lack of success of any individual car depends largely on its appearance and the comfort which it provides. In both these respects it has been the growing custom of late to borrow designs from a manufacturer whose particular cars are selling well, with a steadily increasing tendency to keep away from radical changes in appearance, and confining innovations more or less to the hood and radiator, and to some extent body moldings."

We asked Mr. Pearsons to give his reasons why new ideas in body lines are more likely to come from the front drive rather than the rear drive manufacturer. "In the 'standard' drive of automobile," Mr. Pearsons said, "there is still a preponderance of attention paid to the mechanical end. Moreover, the recent unsuccessful attempts of a limited number of manufacturers to market something really new in the way of body lines has had the effect of making manufacturers even less inclined toward radical departures. Engineering departments realize the difficulty of predetermining accurately whether anything radically new in body lines will be commercially successful. On the other hand, if that engineering department is supplying a mechanism which presents a new and valuable sales argument, it offers the possibility of giving the body a new treatment individually expressing the new mechanical design, which, with the present limitations of front wheel drive cars to the upper price ranges, would further increase the sales value of that particular car. Furthermore, a manufacturer turning out both front and rear wheel drive cars is enabled to use the former as more or less of a proving ground for new ideas in body de-

sign, which, if proven desirable in themselves, can later be adopted in or modified for the standard type of automobile."

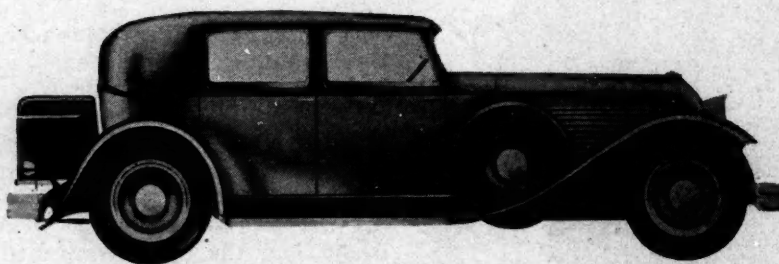
We next asked Mr. Pearsons what in his opinion would provide the most likely developments in body design as brought about by the front drive car. "Primary advantage of the front drive car, from a body design point of view, naturally centers around the decreased frame height and the elimination of the rear axle kick-up," Mr. Pearsons replied. Continuing, he said: "The manufacturer of the front wheel drive has the option therefore of either lowering his overall height to the full amount made possible by this change, an amount impossible of attainment with standard design, or he can use the decrease in height only partially and devote the rest of it toward increasing passenger comfort and convenience."

"With the first option, of course, speed will be higher, and the lower center of gravity will further contribute toward increased safety at these high speeds, while with the latter option the total height can still be reduced considerably in comparison with standard designs, but greater headroom, greater ease of entry and exit through larger doors, deeper seat cushions and wider bodies can also be provided. Both have their advantages, but it seems to me that since the automobile is primarily 'transportation,' that a universal reduction in overall height to an extent which impairs passenger comfort would probably not be desirable in the long run."

To illustrate his point, Mr. Pearsons showed us some experimental designs produced by Baker-Raulang, wash-drawings of which accompany this article. "These cars," Mr. Pearsons stated, "were laid out for a car with 136 in. wheelbase, having a distance from the front axle center to the dash of 46 in., a 42 in. length of engine bonnet, and a 6 in. spacing between the front axle center and the front edge of the hood. In laying out the designs, it was planned that the face

of the radiator core would be in line with the axle center. These details, of course, probably could be rearranged to suit mechanical conditions without materially disrupting the general design.

"In the case of these cars," Mr. Pearsons continued,



*Drawing of Baker-Raulang experimental 136 in. wheelbase front drive sedan body showing the clean lines resulting from the practical elimination of the running board splash guard ledge*



"we did not avail ourselves completely of the extremely low road clearance which this type of chassis could provide, but rather we held to within 3 in. of what might be termed a low car of regular design. As a result we obtained what we believe to be one of the most comfortable bodies that has ever been produced.

"A design feature, which this car immediately made possible aside from that of clean lines, was a new method of terminating the front end. With the desirability of enclosing all exposed chassis parts, we provided a curved shroud in front of the radiator core, which is of normal design, the shroud serving both as a radiator cover and as an enclosure for the front axle drive mechanism. At the same time we left the radiator filler cap in the normal position above the core but eliminated the abrupt vertical lines of the conventional radiator shell, thus increasing the streamline effect. The front of the shroud itself is an open grill of sufficient size to provide proper cooling and may be equipped with shutters for winter use. If extra cooling is desired, the radiator core could be made to follow the lines of the shroud.

"A further plan in this front construction," Mr. Pearsons stated, "was to eliminate the gap between fender inner skirts or splash guards and the hoods, common to all cars. This we did by building the shroud of sufficient width to meet and become part of the front fender inner skirts, and curving it to a point approximately 8 to 10 in. back of the front spring eye, with the forward portions of the spring horns covered with a suitable pan. With this design we were enabled to develop a new fender line, the hood following the contour of the fenders, and the latter providing the customary ledge for fastening."



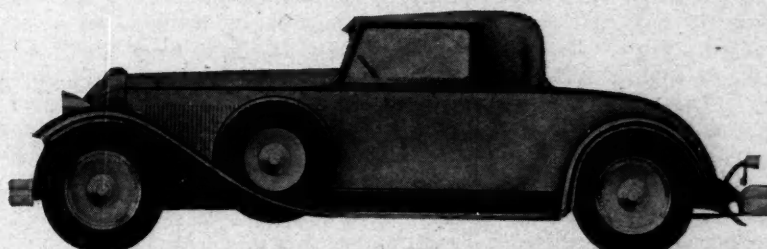
*Raised and depressed paneling of bodies are stamped into the sheet metal, in place of the usual body moldings, in the design of the roadster illustrated*

Questioned as to the effect on head resistance of this type of design, Mr. Pearsons replied: "Without being versed in the fundamentals of air currents, it appears to me from a study of modern lighter-than-air craft that a fairly blunt, but well rounded nose with a body tapering off toward the rear is aerodynamically superior to the reverse type of design which has since the early days of closed cars been used for automobile bodies. Working from this basis, we designed the body with ample width for three passengers in the front seat and two in the rear, extending the body sides to the running boards and eliminating the usual running board splash guard ledge, which to my mind often gives the appearance of a dissociated body and chassis.

"Partly to further reduce air resistance by better streamlining and partly to eliminate glare we also provided a sloping windshield by slanting the front

corner pillars back and bracing them from the roof side rails. This further assists in reducing the abrupt termination of the upper body at this point, and, I believe, materially improves its appearance."

Noting the small use of body moldings on these cars, we asked Mr. Pearsons his opinion on this subject. "What we tried to do in these cars was to produce a clean design which could stand on its own merit without the use of body moldings as a 'restora-



*Illustrating some of the possibilities of body design developments in connection with front drive automobiles, this experimental Baker-Raulang coupe has an unusual front end treatment*

tive' measure," Mr. Pearsons stated. "In fact there are no applied body moldings on any of these cars. On the sedan, the line following the radiator shroud and hood, passing around the rear of the car, and the paneling around the windows, is a raised panel stamped into the body panels and sheet metal. In the coupe more or less the same method was used, but here the line around the rear of the body has been converted into a panel completely covering the top of the rear deck. In the roadster we have practically reversed the process, the lighter colored main part of the body being a raised panel with a depression running around the rear, and along the bottom sides of the body.

"The variation in color for the front and rear parts of the body, without the appearance of broken up color patches, further makes it possible to provide the innovation on this body type of having the front fender color match the rear, and the rear fender the front part of the body color."

## Aluminum Truck Bodies

*(Continued from page 939)*

better time can be made, particularly when hauling light loads. The higher scrap value of the worn-out body has been referred to already.

In the construction of truck bodies of aluminum, use is made almost entirely of what are known as the strong alloys. For instance, one of the first aluminum bodies built had longitudinal sills consisting each of two extruded 5-in. channels placed back to back, cross sills consisting each of two extruded 3-in. channels placed back to back, a floor of 3/16 in. gray plate, and sides, end and tail gate made of No. 7 gage flat sheet. Aluminum extruded shapes are made in channel, I-section and Z-section forms, and these, together with sheets of various gages, permit of building up bodies of almost any desired design, the parts being riveted and welded together.

The present move toward aluminum alloy truck bodies seems to have originated with the construction of an aluminum semi-trailer body which was exhibited at the American Railway Association convention in Atlantic City early in 1926.



# Nickel and Chromium Alloys Effect Carbon Balance In Cast Iron

*Character of matrix in gray iron used for engine cylinders changed by addition of these elements, scientific discussion by Professor D. Hanson shows*

IT is now about five years since alloyed iron was first introduced for the cylinders and pistons of automotive engines, and while its use has not become general, those who have adopted it have continued to use it, which indicates that they consider the beneficial effects of the alloying elements sufficient to warrant the additional cost. The alloying elements used are nickel and chromium, nickel sometimes being used alone, while chromium is generally used in combination with nickel. While a good deal has been written on the effects of these alloying elements on the physical properties of the iron, the subject has rarely been investigated from a strictly scientific point of view. It is from that point of view that it was dealt with in a series of two articles by Prof. D. Hanson, D.Sc., which appeared in the March and April issues of *The Metallurgist*.

Professor Hanson points out that the properties of cast iron depend chiefly on the condition of the carbon in it. In white irons, carbon occurs wholly as iron carbide, in blackheart malleable iron it may be present wholly as graphite, while in the majority of irons used for industrial purposes it is present partly as graphite and partly as iron carbide. If the casting conditions are fixed, any variation in the five constituents of cast iron besides the iron (carbon, silicon, sulphur, phosphorus and manganese) disturb the balance and change the relative amounts of the carbon constituents, and in practice such variations, chiefly in the amount of silicon, are used to vary the properties of the iron.

The alloying elements, such as nickel, chromium and vanadium, have characteristic effects on the carbon balance, and their influences on the iron are partly determined by these effects. For instance, nickel and aluminum act in the same manner as silicon and carbon, in that they increase the amount of graphite and reduce the tendency of the iron to solidity in the white form. Chromium and vanadium, on the other hand, act as sulphur in increasing the amount of combined carbon, and facilitate

the formation of white iron. The effect of any particular addition also depends on the nature of the iron to which it is added. For example, an iron low in silicon, that solidifies in the white form, can be rendered gray, by adding nickel, but will be unaltered in character by adding chromium. Nickel will have much less effect on an iron, high in silicon, that already has little combined carbon, whereas the addition of chromium, by increasing the combined carbon, will have a marked effect on both structure and hardness.

In the case of gray irons as used for engine cylinders, the alloying elements also have another effect in that they change the character of the matrix. In steels, both nickel and chromium have a well-known refining effect, small quantities of them facilitating the production of sorbitic and martensitic structures during cooling at moderate rates, while larger quantities impart air-hardening properties. These same effects can be obtained also in cast iron; nickel and chromium both change the pearlitic matrix, while silicon and aluminum have no such effect.

Professor Hanson states that the effect of an alloy addition to cast iron depends not only on the added element but also in a large measure on the iron to which it is added. This he illustrates by giving—in Fig. 2—graphs of the effects of various additions of nickel on the Brinell hardness of the iron. The iron to which these curves refer contains  $3\frac{1}{2}$  per cent of carbon, while other elements are present in small quantities only. The full curve refers to sand castings 1 in. thick, while the dotted curve refers to sand castings  $\frac{1}{8}$  in. thick. Both curves are similar in their general form. With small additions of nickel there is an increase in hardness, but a maximum is soon reached and is followed by a rapid decrease in hardness. This rapid decrease is followed by another rise, and the curve passes through a maximum to another, more gradual, period of decreasing hardness. Professor Hanson states that he has obtained this type of curve with many different cast irons. The changes in hardness,

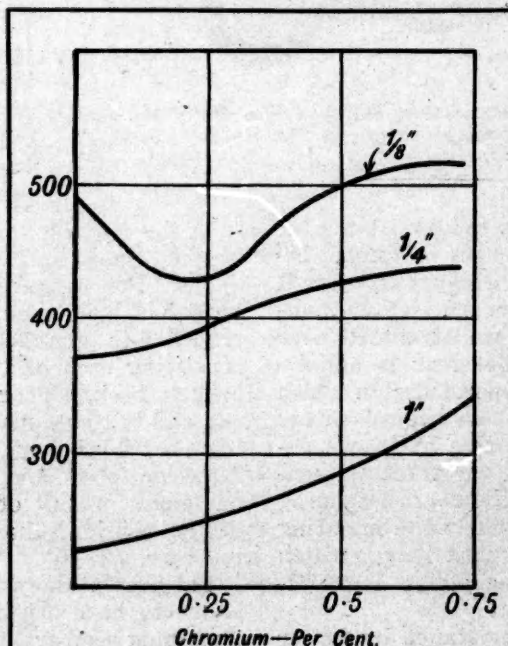


Fig. 1. Graph of effects of small chromium additions to cast iron



which are brought about by gradually increasing additions of nickel, can be explained readily by studying the micro-structures obtained. The iron used was a white iron even when cast in quite heavy sections. Increase in hardness due to the addition of small amounts of nickel is not due to any structural changes but to the entrance of nickel into solution or into combination with cementite. The first decline in hardness is due to an active graphitizing action of nickel, carbide in the iron being replaced by graphite due to this cause. During the next stage, marked by another increase in hardness, the refining action of the nickel on the pearlite predominates in its effect on the hardness over the graphitizing effect, the matrix becoming sorbitic, troostitic or martensitic, according to the amount of alloying material added. The final fall in hardness is due to the replacement of martensite by austenite as the nickel is increased, the matrix becoming entirely austenitic when the nickel content reaches 14 per cent.

Commenting on the changes in hardness of the two specimens with addition of nickel as shown in Fig. 2 Professor Hanson says:

"In the  $\frac{1}{8}$ -in. sections, the hardness is greater and the changes are concentrated over a much smaller range of nickel contents. This is due solely to the difference in section of the two sets of castings. A 1-in. section cools more slowly than a  $\frac{1}{8}$ -in. section. It is therefore less prone to solidify as white iron than is a casting of smaller section, and the graphitizing effect of nickel is observed with smaller additions. Other things being equal, the first peak is therefore found at lower nickel concentrations the thicker the section of the casting. The matrix structure is also influenced by the rate of cooling, as we have long recognized in alloy steels, in such a manner that sorbite or martensite formation is obtained with lower alloy additions, the faster the rate of cooling. The position of the second maximum corresponds with this principle, occurring at a lower alloy concentration for the thinner section.

"The differences in hardness figures also call for comment, since they must be accounted for by any general theory. They are quite consistent with the explanation given. In the thin sections it is possible to retain carbon wholly in the combined form with much more nickel than in thick sections, owing to the 'chilling' effect of rapid cooling, and the greater hardness of the white iron is due to the solution in it of this larger amount of alloying element. This feature of the first peaks can thus be explained. The differences in the second peaks are due partly to the differences in the rate of cooling through the lower critical points, the more rapid rate giving a greater refinement and hardness in the matrix; and partly to the differences in the cooling rates from the solidification point to the critical range. The slower the rate of cooling, and the greater the nickel content, the more the iron approaches its equilibrium conditions in which graphite is the stable constituent, so that, as

nickel is increased and the section of the casting becomes greater, the amount of combined carbon in the matrix becomes reduced. The impoverished solid solution, after transformation at the eutectoid point, will clearly give a softer matrix. Both these effects act in the same direction, and give a second maximum at a lower hardness figure for thick sections."

The change in the structure of the iron with nickel additions is plainly shown by fractures. With not over 2 per cent of nickel the fractures are white; with 2.5 per cent they are mottled, showing that the drop in hardness is due to graphite formation; with 3 per cent the fracture is still mottled, although the matrix is now martensitic.

The effect of nickel is dependent upon the amount of silicon present. When silicon is added to white iron (without nickel), the first effect is to increase the hardness of the iron, but a point is soon reached where the strong graphitizing action of the silicon becomes effective and the hardness begins to drop rapidly. The point where a maximum hardness is reached depends upon the thickness of the section, the same as with nickel, but

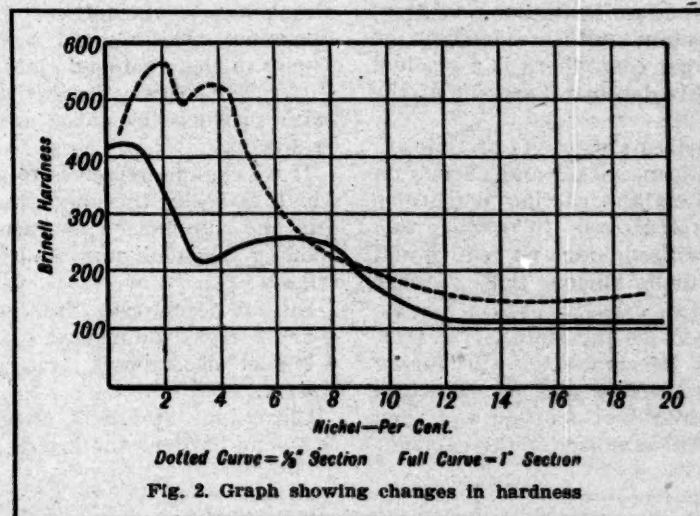
there is this difference between the effects of silicon and nickel that the hardness concentration curve of the former shows no second maximum, the hardness continuing to decrease with increasing amounts of silicon. Silicon decomposes eutectic and pro-eutectic carbide and also pearlite carbide, so that an iron with large silicon content may have a matrix consisting almost entirely of ferrite.

Thus the effects of nickel and silicon on eutectic and pro-eutectic carbide are the

same, both producing graphite, but the effects of the two elements on pearlite are contrary: Nickel does not decompose it, but refines and hardens it, giving a strong matrix, while silicon decomposes it, giving more graphite and a soft, weak matrix.

When nickel and silicon are both present, the final result is substantially the sum of the individual effects. In Fig. 3 is shown the effect of various additions of nickel to an iron containing 1.3 per cent of silicon. Comparing this with Fig. 2 it will be seen that the initial peak is missing, which is due to the fact that the silicon present prevents the formation of eutectic carbide. The thin section possesses a gray fracture, with white edges, and contains pro-eutectoid, which is decomposed by addition of nickel giving the observed fall in hardness. The thick section is completely gray in fracture, and contains but little pro-eutectoid graphite, and the softening (graphitizing) effect of nickel is correspondingly small. The hardness of the low-nickel irons is also much less than in the former series on account of the reduced amount of cementite.

The effects of small chromium additions to cast iron are shown in Fig. 1. The  $\frac{1}{8}$ -in. section has a white fracture when containing no chromium; the  $\frac{1}{4}$ -in. section, a mottled fracture, and the 1-in. section, a gray fracture. In each case the hardness increases with the



Dotted Curve =  $\frac{1}{8}$ " Section Full Curve = 1" Section

Fig. 2. Graph showing changes in hardness



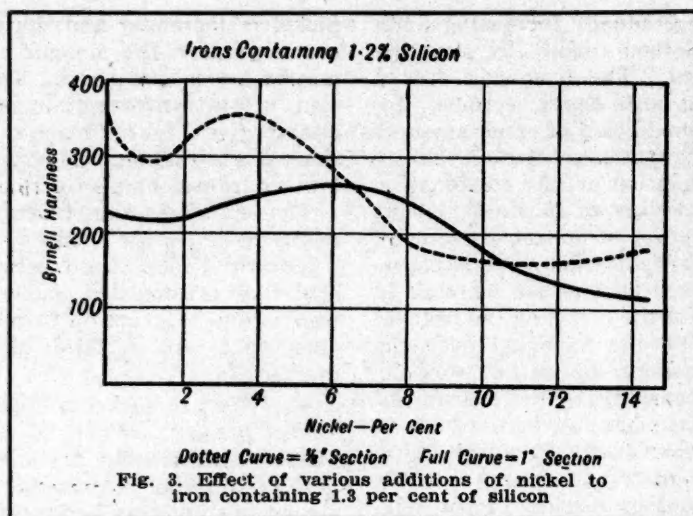
chromium content. In the thin section the chromium enters into the cementite and increases its hardness; in the medium section the chromium changes the character of the iron from mottled to white through its stabilizing influence on iron carbide, 0.4 per cent of chromium being sufficient to complete the transformation. In the thick section the hardness rises slowly at first and later rapidly, the fracture becoming first mottled and then white.

Chromium influences cast iron chiefly through its stabilizing effect on the carbide, but it also refines and hardens the pearlite, the same as it does in steel. In this respect the effect of chromium is similar to that of nickel and rather more potent. With additions of chromium up to about 0.25 per cent, there is a gradual increase in hardness, which is due to refinement of the pearlite.

Professor Hanson summarizes his results as follows:

(1) Small amounts of silicon, nickel and chromium harden white iron so long as the casting conditions preserve a completely white structure. In practice this effect of silicon cannot be utilized, since no commercial chilled irons contain so little silicon that further amounts can usefully be added.

(2) Silicon and nickel decrease the stability of iron carbide, and facilitate its decomposition, producing graphite. They decompose eutectic and pro-eutectoid carbide, and render white iron first mottled and then gray. Chromium increases the stability of the carbide;



but a pronounced refining and hardening action.

(4) High percentages of silicon produce a soft gray iron with a ferrite-silico ferrite-matrix. With high nickel, a soft austenitic gray iron is obtained. High chromium gives a hard white iron containing carbon wholly in the combined state.

(5) For equal graphitizing effects, the graphite flakes produced by nickel are finer than those produced by silicon.

If we confine ourselves to good grades of gray iron—which is really the only grade of cast iron that interests the automotive engineer—the effects of the two alloying elements may be stated still more briefly as follows:

Silicon decomposes free carbide—eliminates chilling—and softens the matrix.

Nickel decomposes free carbide, but hardens the matrix.

Chromium stabilizes free carbide—increases chilling—and hardens the matrix.

## Mid-Year Outlook Indicates Keener Competition Ahead

(Continued from page 936)

bringing out of a new model will be essential to the realization by any manufacturer of a satisfactory sales volume this fall. Recent examples have proved to most executives that even the manufacturer who is enjoying a high sales volume because of a popular model is compelled by the pressure of competitive efforts to continue making improvements.

Sales of new models in the fall normally is expected to result in greater accumulations of used car stocks, and this fall is not expected to prove an exception. If it is found necessary, as it may be in certain instances, to reduce new car prices in the fall, if not sooner, to sell models that are going out of production, the used car situation doubtless will become even more embarrassing to dealers.

No extensive or general price cutting is expected by most executives, who declare that the narrow margin of profit now being realized by manufacturers, particularly in the lower price range, will not permit it, even in the face of the more intensive competition that has been predicted for this fall.

Members of distributor and dealer organizations of manufacturers who protect them by means of cash refunds in the event of price cuts should feel more at ease in contemplating the possibilities of price cuts.

Doubtless the dealer group also appreciates the positive provisions that have been made in the last few months by the manufacturers to guard its members against the recently increasing encroachments of new car "bootleggers." Several manufacturers have added clauses to their contracts providing for the imposition of a cash penalty upon any distributor or dealer who sells an automobile to a new car "bootlegger" or oversteps his territorial limits. In making sales, the amount to be determined by the manufacturer, in most instances, and usually equaling the sum of the commission. A number of other manufacturers are planning to add similar clauses to their dealer contracts, largely upon the basis of the recent recommendation of the National Automobile Chamber of Commerce, which has made a study of the situation. A season of enforced price cutting naturally would be expected to exacerbate the "bootlegging" evil, and would be a testing time for any provisions directed toward its extirpation.

In any event, economic developments naturally will have a determining influence as to the success or failure of the automobile industry in the last six months. However, only an exceptional depression is likely to prevent the industry from establishing new all-time records in 1929.

it will therefore produce pro-eutectoid and then eutectic carbide in a gray iron, and will make the fracture first mottled and then white.

(3) Silicon does not refine pearlite, but readily decomposes it, producing a soft matrix of ferrite. Nickel has a very mild graphitizing effect on pearlite. Its refining and hardening action is well marked, leading to the formation of sorbite, troostite or martensite. Chromium has no graphitizing effect,



## Just Among Ourselves

### Visitors—Not Exhibitors— Are Final Judges at Shows

WHEN we get to talking about injecting new and vitalizing ideas into the automobile shows, national and local, it's worth remembering that the dear old public—not the exhibitors—will be the final court in judging the newness or vitality of the ideas. A number of slight changes might make an automobile show seem full of innovations to executives familiar with just what had been there before and what had not. The newness and vitality of a feature might easily be proved to a committee, with the time and obligation to analyze it in relation to previous features, and still fail utterly to make any impression whatsoever on the casual or potential show visitor.

Scores of times we have made typographical and policy changes in our publications which were the result of prolonged conferences and which our editors felt were quite radical, only to find later that what seemed to us a terrifically radical departure registered among our readers as any change at all only when it was called specifically to their attention.

\* \* \*

### Customer's View of Changes Easy to Overemphasize

SO with remodeling the automobile shows, if it should be decided that revitalizing is needed. What will seem like dynamite to the experts concentrating their whole time and attention on the proposition, is likely to register only as the discharge of a cap pistol in the mind of Mr. Average Man, to whom an automobile show is just one incident a year in a life devoted almost entirely to other things.

Whether it concerns injecting new features into automobile

shows, publishing business papers, redesigning automobiles, or changing designs of parts and accessories, it is very easy for most of us to overestimate the importance which will be given to the change in the minds of our customers who, inevitably, are interested in our product only as one item among many.

\* \* \*

### Advertising Generalities Hint of Limited Knowledge

SINCLAIR LEWIS, in a recent essay, advises aspiring novelists not to bother about straying around the world to see life, but to write about what is under their noses. Richard Hughes in a subsequent article agrees that for some writers the idea of recording the scene in which one was born and reared is good, but disagrees that they should stay home to do so. Material in a novel, he argues, consists of two parts: what you put in and what you leave out. Both parts are equally important, and what you leave out necessarily is the most voluminous. A complete and broad picture of life, Hughes argues, is necessary if you are to know what to put in and what to leave out even when writing of what is under your nose.

Writing automobile advertising and sales promotion seems to us to have the same requirements as a novel, in this respect. We are intrigued by the theory that many of the all-embracing adjectives, the broad claims and the glittering generalities of automotive advertising may be caused by lack of knowledge on the part of the writer as to what to leave out. For fear of leaving out the wrong thing, perhaps subconsciously he falls back on inclusive generalities for safety's sake. Anyhow the thesis seems to us to be worth laboring a bit in thought.

### Advertising Abroad Has Its Own Parlance

WASH the windscreen and the quarter and back lights of this saloon, please, and adjust the strangler and the suction wiper. Then fill the tank with anti-pinking petrol." According to a piece of publicity which drifted across our desk today, the foregoing is the way in which an English motorist would tell a mechanic to clean the windshield and the side and rear windows of his sedan, adjust the choke and the windshield cleaner, and fill his tank with anti-knock gasoline. All of which is just another indication of the problems involved in writing properly advertising copy for foreign markets.

\* \* \*

### Australian Import Taxes May Go Higher

TALKED with an Australian automotive man recently who voiced some interesting views as to the future of the automotive tariff situation in that country. Desire on the part of Australians to advance the industrialization of their essentially agricultural country, he says, is very strong. On this basis, further tariff advances in that area are probably to be looked for. Without detailed knowledge of the situation, it would seem as though the gains to the Australian man-in-the-street through such a move might be very small. It would seem quite possible that he would gain more through the chance to buy cheaper, efficient individual transportation than through the attempt to establish various automotive industries under none too favorable conditions. We admit, however, to being in no proper position to comment very definitely on the matter one way or the other.—N. G. S.





## Books for the Business Bookshelf

### "And Then Came Ford"

Charles Metz. Doubleday, Durand & Co., Inc., New York. 321 pp. \$3.

**M**R. METZ, who became well known last year as the author of a "best seller"—*The Great American Band Wagon*—has turned his inquiring mind to one of the best performers on the wagon—Henry Ford. The book is not another biography of Ford, but rather is an attempt to use Ford as a symbol of America, with its wealth, its ingenuity and its determination to go places and do things. In a very interesting account of Ford's life during the last 60 years, Mr. Metz has managed to convey a picture of the development of the country during this time, and finds that the manufacturer of the Model T has greatly broadened the orbit of this nation's travel, defied its precedents, challenged its history, collected its antiques, enriched its folklore and remade its legends. The book is written in a very interesting manner and will be read eagerly by persons interested not only in Ford, but also in the development of American life during the past half century.

### Fluid Dynamics for Aircraft Designing

Max M. Munk. The Ronald Press Co., New York. 198 pp. \$8.

**D**URING the past 12 years, in which the author has specialized on aerodynamics, many experiments have been made to test various theories, and a number of mathematical formulas were developed to explain phenomena observed in research and flight tests. The most useful portions of that work have been collected in the present volume, with much improvement and simplification of the formulas having been made possible by the availability of more complete data. Considerable attention has been given in the book to the application of formulas and to their relation to other theories. The general subjects discussed include the aerodynamic forces on airship hulls, potential flow of the straight line, wing section theory, propeller theory, air friction and similar items, all of considerable interest to aircraft designers.

### Industrial Advertising Copy

R. Bigelow Lockwood. McGraw-Hill Book Co., Inc., New York. 328 pp. illus.

**R**EALIZING that industrial advertising is distinct from general advertising, and has its own practices, this book is devoted entirely to this particular type of copy. Case material is used to a large extent in discussing such subjects as planning the layout, headlines, illustrations, finding and writing material, use of color, coupons, testimonials, and similar items. The prominence of the author in the field about which he writes, and the extensive use of actual examples taken from successful industrial advertising campaigns, makes this book particularly useful to all interested in industrial advertising copy.

### Harvard Business Reports, Vol. 6

A. W. Shaw Co., Chicago. 154 pp. \$7.50.

**T**HIS sixth volume of the well-known series of Harvard Business Reports contains cases concerned with industrial marketing, a subject which has received

inadequate attention heretofore, even among business men themselves. The same methods employed in previous volumes have been followed. That is, all the conditions surrounding a particular marketing problem are presented, then the plans followed in solving the problems, with a report of the result obtained.

### Financing of State Highways

H. W. Willson Co., New York City. 209 pp. \$0.90.

**T**HIS book is one item in the reference shelf series put out by the publishers, which consist of reprints of selected articles, briefs, bibliographies, debates and study outlines on various subjects. The present book is an attempt to collect in one place all the important arguments for and against the various methods of financing state highways and should be of some value to those fostering state highway improvement programs.

### Business Correspondence

By Harry C. Marcoux. The VanAustin Co., Inc., New York. 329 pp. \$2.50.

**T**HIS book is somewhat different than many similar books on business correspondence, in that the author believes that the principles of good letter writing are relatively unimportant, at least when compared with the actual ability to write effectively. In carrying out this program, a rather small amount of space is devoted to the outline of principles which should underlie all successful business letters and the remainder of the book is devoted to analysis of actual letters which have been used successfully by a very large number of concerns. The book is very well organized, contains separate discussions of some dozen different types of letters with the specific principles underlying each being given, as well as a number of examples of how these principles have been applied in actual successful business correspondence.

### Production Planning

John W. Hallock. The Ronald Press Co., New York. 172 pp. illus. \$4.

**T**HIS book is an attempt to treat the problems of engineering design in the operation of factory equipment in the same scientific and mathematical manner which has been adopted in dealing with other technical subjects. It is intended for text-book use and also as an organized reference book for men responsible for production in manufacturing concerns. The author shows how to use mathematical relationships in answering practical questions and solving everyday problems of production. In the discussion he seeks also to balance principles, methods and business expediency in the way in which they are presented under operating conditions. Subjects discussed include estimating for production, determination of machine capacities, computing process time, material handling, material and tool control, standard instructions, reduction of process time, and similar items. The mathematical treatment of these subjects is quite different from that ordinarily found in such books, so that this volume should be of particular interest to manufacturing executives.



# Tungsten Carbide Cutting Edge Renewed by Lapping Operation

*The characteristic hardness of the alloy actually places it in a class comparable to precious stones, requiring a fine and soft grinding wheel.*

By S. M. HERSHEY

*The Abrasive Company, Philadelphia*

RECENTLY there has come to the foreground in the metal cutting industry varied alloys of tungsten, carbon and cobalt. Manufactured under numerous trade names, perhaps the best known are Carboloy and Widia. Others are Borium, Hartmetal, Dynit, Diamondite, Duridium and Miramant. Despite the extreme hardness of tungsten carbide and its ability to hold its cutting edge many times longer than other steel cutting tools, it becomes dull and must be ground to renew the cutting edge.

The characteristic hardness of the alloy actually places it in the class comparable to precious stones, so that renewing its cutting edge with a grinding wheel is really a lapping operation, calling for a fine and soft wheel in preference to a hard coarse wheel.

Abrasive engineers, both inside the Abrasive Company laboratory and outside in the shops, have made extensive experiments before selecting the most efficient grinding wheel for this work. The extremely high cost of tungsten carbide has made necessary its marketing in only two forms at the present time, one a finished tool ready for work and the other a rough tip to be mounted and ground to final form by the customer.

Recommendations call for an Electrodon wheel: For all around grinding Electrodon 60 I. For roughing Electrodon 46 IE or JE. For finishing Electrodon 80 to 120 IE according to size of tool to be ground.

To date all of the work has been done by off-hand grinding, usually dry. Even in this procedure great care must be exercised so as not to check the tungsten carbide material. In holding the tool to the wheel, the position must always be so the grinding is against the

cutting edge. The tool should be traversed across the face of the wheel and not fed in straight by direct pressure. The pressure should be extremely light.

Nothing is gained by "riding" the wheel. Extreme care should be used so that the tool does not become hot from grinding. Particular attention is called to the grinding of the tool where a tip or cutting edge of the tungsten carbide alloy is brazed or welded on a steel tool holder.

It is evident from Fig. 1 that in order to grind the cutting edge of the tungsten carbide alloy, a portion of the steel holder must be ground also, and this cannot be ground successfully with the same grain and grade of wheel that is used for the alloy grinding.

The nature of the wheel required for the successful grinding of tungsten carbide is such that it does not permit a fast removal of the steel on which the alloy is mounted. Best results are assured if the steel holder is relieved before grinding the cutting edge, as designated by C

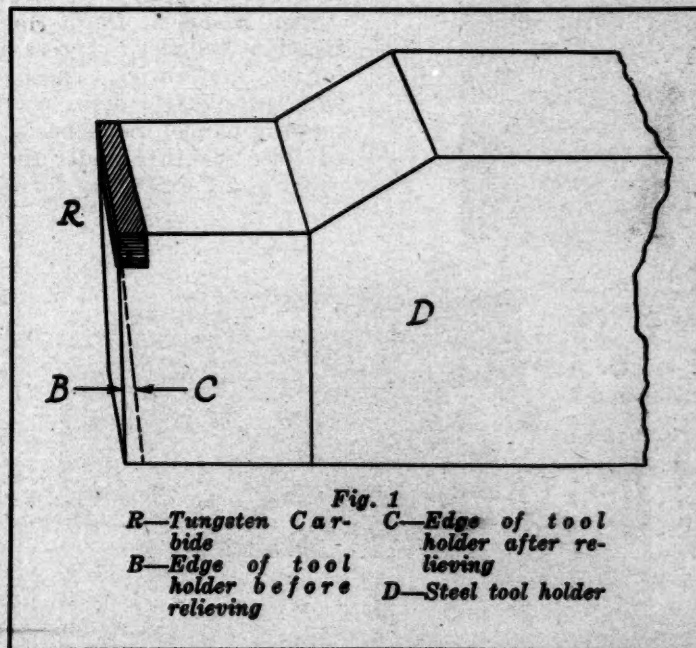


Fig. 1

R—Tungsten Carbide  
B—Edge of tool holder before relieving  
C—Edge of tool holder after relieving  
D—Steel tool holder

in Fig. 1. By using a regular grain and grade (Borolon 24") that is commonly specified for tool grinding, a proper clearance is provided on the holder permitting a freer and cleaner grinding operation of the wheel intended for the tungsten carbide.

Regrinding the cutting edge of the alloy then becomes simplified, in that the wheel only comes in contact with the tungsten carbide.

These suggestions and recommendations may only serve as a starting point. Outside conditions and practice are so varied that it is impossible to develop standards readily. As tungsten carbide comes into more general use, more definite conclusions can be drawn.

# Multi-Wheeled Traction Trucks Tested in Army Demonstration

*Commercial makes compete under severe conditions with vehicles designed and developed by service men, at Holabird Military Transportation Pageant.*

By JAMES W. COTTRELL

**T**HE Military Transportation Pageant and Exposition arranged by the Holabird Quartermaster Depot, U. S. Army, Baltimore, Md., June 12, 13 and 14, gave makers of commercial trucks an opportunity to test their vehicles under arduous conditions in comparison with special vehicles designed

Because of the severity of the test courses laid out, which partook of the nature of off-road traveling to which trucks used in work such as erection of cable and power lines frequently are subjected, ample power and traction and correct distribution of weight were required to meet them. As a consequence, six-wheelers, four-wheel drives and overhanging power-plants were much in evidence. In fact, in the exhibition of trucks and component units, held in connection with the tests, trucks incorporating special traction and load carrying features predominated.

The Holabird Depot demonstrated three special traction vehicles, representing Army developments for military service. These included a six-wheel truck with gas-electric drive to the front wheels and the forward pair of rear wheels. The motors were mounted close together under the frame with a short propeller shaft extending forward to a double reduction front axle and the other propeller shaft extending to the rear to a double reduction power axle. A rear pair of wheels was mounted on a worm-drive axle with the driving unit omitted. The truck is shown in Fig. 4. Another Army six-wheeler had the drive transmitted mechanically to the front and rear. As shown in Fig. 5, it was equipped with dual pneumatics all around. The

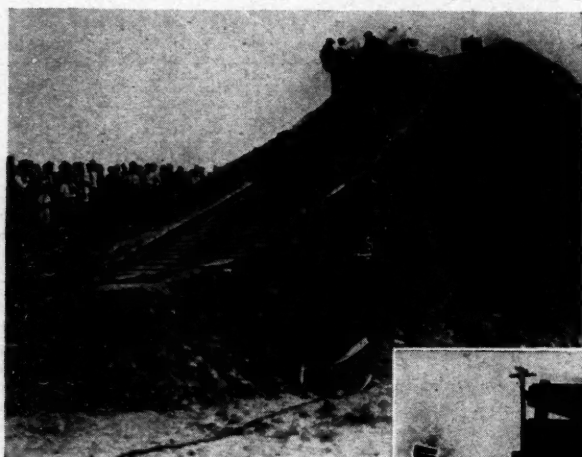


Fig. 1—Above: An artificial hill with plank road on a grade increasing to 70 per cent tested the hill-climbing ability of trucks. The truck shown is the Browning-Christie eight-wheel-drive ten-wheeler



Fig. 2—Right: A six-wheel Moreland is passing over the concrete humps arranged in sequence to test frame weave

and built at that depot by Army service engineers. Intended to portray the uses of motor vehicles in military service, these tests attracted some trucks which incorporated features of design of particular value for military service but the majority were commercial vehicles.

The tests included hill-climbing on a plank road with grades up to 70 per cent and traversing mud 30 in. deep, plowed fields, fresh gravel and a staggered row of concrete humps designed to bring about frame distortion.



Fig. 3—Above: View of a crawler during traction test in 30 in. of mud



third vehicle incorporated a rubber track four-wheel rear assembly and a pair of pneumatic-tired front wheels driven mechanically.

Four-wheel drive was used in several combinations on four, six and eight-wheel vehicles, in the commercial group. Four-wheel-drive four-wheelers were shown by F.W.D., Coleman, Freeman and Walter. The drive on four rear wheels of six-wheelers was employed by Diamond T, Brockway-Indiana, Moreland, and Maccar. Crawlers with steel and with rubber tracks on four-wheel rear units, attached to standard trucks, were demonstrated by Christie Crawlers, Inc. (Fig. 3).

Six-wheel drive on six-wheel trucks was employed by Coleman, one of the trucks being equipped with a single tire on each wheel and the other with duals all around, the latter having 12 tires. F.W.D. displayed a six-wheel, four-wheel drive truck with drive on the front wheels and the forward pair of rear wheels, the extra wheels being mounted on a dead axle. The Dual Duty Co. attachment for Ford AA trucks provides an extra pair of wheels ahead of the regular axle and driven by chain from the standard Ford rear wheels.

An eight-wheel Versare truck, shown by the Cincinnati Car Corp., embodying two four-wheel bogies, demonstrated sharp turns to right and left and figure 8's and attracted considerable attention. Each of the four-wheel assemblies of this truck has two wheels driven electrically from a gas-electric powerplant and the other two wheels steer. Another multi-wheeled vehicle shown was the Browning-Christie ten-wheeler. This truck has drive on eight wheels, there being four in a group on each side of the rear of the frame, arranged like a roller skate.

#### Dual Pneumatic Tires Used

Dual pneumatics, both high pressure and truck balloon, were used on rear wheels of most of the trucks, including the six-wheelers. Two different sizes of tires were used on the front wheels of the Walter four-wheel drive truck, which was equipped with dual tires on all four wheels. Each front wheel was equipped with one tire the same size as the duals on the rear wheels and outside of this tire was a smaller tire, mounted normally but not in contact with the ground. The purpose of this combination is to provide ease of steering during ordinary travel when the two large tires are in contact with the ground and to add the traction and load-carrying ability of the extra pair of tires in sand or mud. This truck was also equipped with a slanting steel mud pan under the engine to prevent packing of mud forward of the front axle in really bad going.

Weight distribution is an important feature of design for climbing steep hills and other severe service and obviously is a vital factor in the success of four-wheel-drive vehicles for such duty. Examples of powerplants overhanging the front axle to increase the net tractive effort of the front wheels were the Hug Roadbuilder—a two-wheel drive, Walter, Freeman, Coleman and F.W.D.

Four different methods of drive on front-wheel drives were in evidence in the tests. The Coleman

employs a large universal joint just within the front wheel, driven by a double reduction axle, similar in construction to an ordinary rear axle. F.W.D. uses a universal joint, on each side, in a ball and socket



Fig. 5—Above: A special type of Army design six-wheel truck with mechanical drive front and rear. This vehicle is equipped with dual pneumatic tires all around



Fig. 4—Left: The Army gas-electric drive six-wheeler. Motors drive the front and forward rear axle through short propeller shafts

assembly in place of the ordinary king pin. The axle is of the bevel-gear type, also similar to a rear axle. Freeman makes use of a double bevel-gear assembly, which requires no universal joint. A dead front axle with a bevel-gear housing mounted above it is used to transmit power. The Walter embodies universal joints in power shafts of an internal-gear drive.

#### Special Features Exhibited

Differing also from conventional design were the Relay, International Harvester and Omort trucks. The Relay axle was shown in action in the booth, wide doors in the side of the exhibition building insuring enough ventilation to permit operation of the truck back and forth over wood-block obstruction. The International Harvester Six Speed Special was shown, in addition to other models. The Omort truck has a two-speed clutch in unit with the powerplant and a four-speed transmission, giving eight speeds forward and two reverse.

The Military Transportation Pageant, shown each day prior to the test, depicted the development of transportation from ancient times to the present. An ox-cart of the time of Ptolemy illustrated the crudity of transportation of that day and later steps in development were shown by the Conestoga Wagon and by the development of rail transportation which included several exhibits from the Baltimore & Ohio Railroad, "Fair of the Iron Horse." Modern military transportation was shown by a parade of World War-type Army automotive vehicles and later types now in experimental stages.

**D**URING 1928 farm tractors to the number of 1279 were imported into France from the United States. This is said to be 900 less than the previous year.



# Economical Reduction of Lean Ores Credited to Smith Process

*This low-temperature mode is claimed to yield higher grade base metal for making alloy steels. Initial plant cost is said to be less than for blast furnaces.*

A PROCESS for low temperature reduction of iron and for the production of fine sponge iron has been developed by William H. Smith, president of the General Reduction Corporation, and formerly associated with the Ford Motor Company in a research and metallurgical capacity.

The process is claimed to yield a higher grade base metal for the manufacture of alloy steels, and to permit of the use of leaner ores than are at present considered economical, although high-grade magnetic concentrates, as well as the richer ores, can be reduced by the process. Characteristics of the process are said to be a lowering of the heat requirements for reduction, and lower initial plant cost than with blast furnaces. The process is claimed to be economical in small as well as in large units and therefore to be practical in plants where a blast furnace would be out of the question.

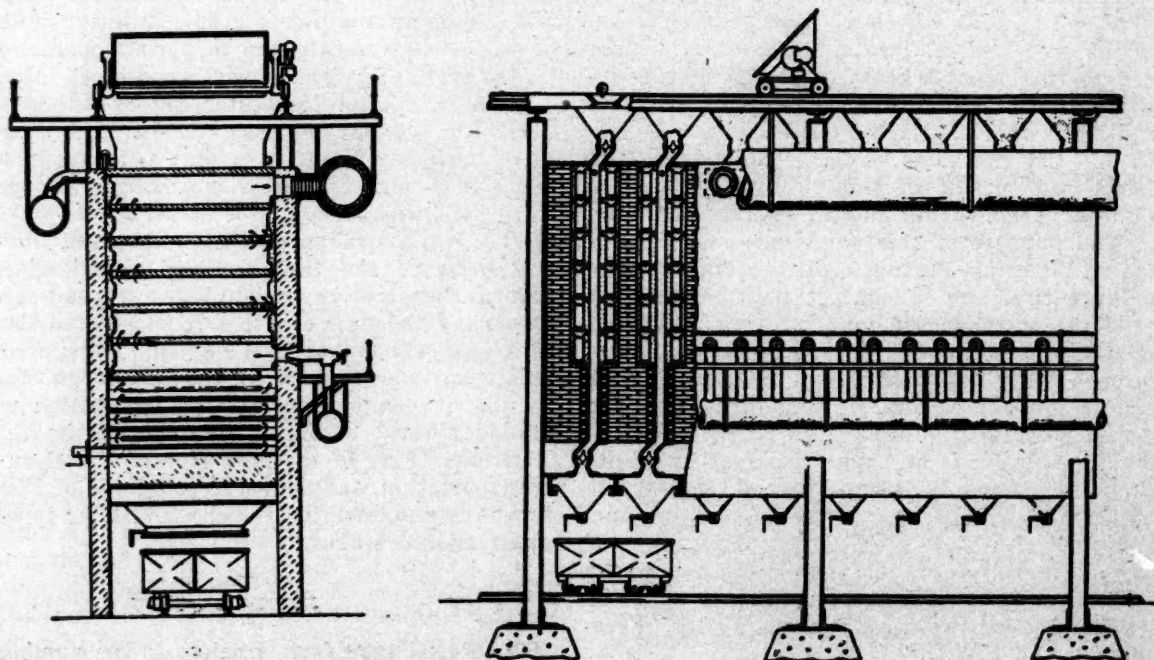
Only recently it has become known definitely that the physical characteristics of pig irons, even if of the same chemical composition, differ widely, due to differences in blast furnace processes. These physical characteristics, moreover, are transmitted to a considerable extent to cast irons and steels made from the pig. The chief variables in blast furnace operation seem to be the combustibility of the coke used, which affects not only the rate of temperature rise, but also the time the charge remains in the furnace, the amount of air supplied and

the amount of moisture carried into the blast furnace by the air.

The variations in these factors are said to be minimized by the Smith reduction process, since it is a progressive process and the amount of air introduced into the furnace is negligible.

The process itself consists in the reduction of iron oxides, etc., in vertical ovens at 2000 deg. F. or less, that is, without fusion. The reducing operation is preceded by a crushing operation, and the crushed ore is mixed with a reducing agent—coke or some other material containing hydrocarbons—and is charged into the furnace at the upper end. It passes through the furnace at the rate of about 1 ft. p. hour. Heating of the charge is accomplished by a gas or oil fire behind carborundum walls or by means of electrical heating coils or grids, the construction in general being quite similar to that of by-product coke ovens.

In the upper part of the oven the ore is preheated by the waste gases on their way to the stack. Below this there are three successive heat zones, in which the iron ore is reduced from  $\text{Fe}_2\text{O}_3$  to  $\text{Fe}_3\text{O}_4$ , to  $\text{FeO}$  and to  $\text{Fe}$ , respectively. In the final zone the temperature ranges between 1600 deg. and 2000 deg. F. for various types of ores and reducing agents. Each zone is controlled separately as to temperature, by an electric-control pyrometer. The advantage of the use of a low tempera-



*Cross-section view of the gas-fired furnace used in the reduction of iron by the process developed by William H. Smith, president of the General Reduction Co., University of Detroit*



ture is said to be greater effectiveness of the reduction action (a greater proportion of the ore is reduced). In the furnace, carbon monoxide combines with  $\text{Fe}_2\text{O}_3$  to form iron and  $\text{CO}_2$ , and then  $\text{CO}_2$  unites with carbon at the reducing temperature and produces  $\text{CO}$ . The arrangement of the furnace itself is such as to permit temperature regulation in all of its parts.

The ore must be fed through the flue in a loose condition, to permit circulation of the gases; otherwise the reduction will not be complete. Four parts of iron ore and one part of reducing agent are generally used in the process, the excess reducing agent being reclaimed in the separator. Among the reducing agents which have been successfully used with different kinds of ores are charcoal, hardwood waste, coke peat, brown coal, oil shale, tar, natural pitch, pressed sugar cane, coffee bean husks, Babassu nuts from Brazil, etc.

Reduction of the iron oxide is said to be practically complete. An interesting feature of the process is said



*An experimental electric furnace for the Smith process, having two flues. View shows three stages of heat control as explained in the text. This particular furnace is located at the University of Detroit*

to be that, if the iron is given sufficient time, it will absorb as much as 1.8 per cent carbon. This is an advantage in the subsequent production of steel.

Concentration after reduction is either by magnetic process, by chemical fixation or both. Working on a 45 per cent magnetite, 100 per cent reduction was achieved, and after separation, 97 per cent iron was obtained.

The work which led to the development of this process was undertaken in an endeavor to obtain better steel for the automobile industry. Steel produced from this iron in an experimental way is said to have shown better fatigue properties than steel produced in the regular

way. This is attributed to the absence of impurities usually found in steel, and also to the absence of gases which are usually found in steels produced from blast furnace irons.

The General Reduction Corporation is not a manufacturing organization. It confines itself to metallurgical investigations and development work.

## PLYMOUTH SPEEDS MATERIALS WITH CONVEYORS

*(Continued from page 942)*

adjacent to the end of the engine assembly line. At the end of the assembly line, engines are placed on a traveling work-level-height conveyor, which already has been described as passing around the engine running-in stands and through the dynamometer installations. Over the engine stands, 250 in number, there is a network of monorails with electric operated hoists. After a two-hour run-in of every engine under its own power, it is replaced on the conveyor, any necessary minor adjustments being accomplished while it is in transit between the running-in stand and the dynamometers. For this purpose the engine carrying cradles are so designed that an operator can hook on a light seat quickly and travel with the conveyor while making adjustments.

Every Plymouth engine is subjected to a dynamometer test, an unusual feature in itself for four-cylinder cars. The dynamometer stands are equipped with quick-acting hold down clamps, one for each of two diametrically opposed corners. Exhaust pipes and fuel lines also are attached with lever operated clamps, so that the entire dynamometer testing, including the mounting, tests for acceleration, power, and quiet, takes about 12 min., giving a total capacity for the 20 dynamometers of 100 engines per hour.

After passing through the engine storage, the approved powerplants are then delivered to the final assembly line. Previously to assembly into the car, fuel tanks have been brought to the line by the same overhead conveyor which carries the propeller shaft.

Next in order are the wheel assemblies. The wood wheels, which are in the majority, are delivered by an overhead conveyor to the completely conveyorized paint-

ing and drying ovens, of which there are four, each equipped with its own conveyor, which passes four times through the oven.

Bodies are delivered to the loading docks by truck from the body plants. They are unloaded with hoists on monorails and placed on special hand trucks for wheeling into body storage. As a rule, unless the specific body type and color are not available at the right moment, they are wheeled directly to the body hardware assembly line, a chain-operated work level conveyor, onto which they are lifted with air operated hoists on monorails, the hoists being equipped with cradles whose arms pass under the body while it is on the hand truck.

The two hardware assembly lines, which also provide facilities for assembling the wiring harness, run transversely to the final assembly lines, terminating only a short distance therefrom. As on other sub-assembly lines, they are provided with automatic shut-offs, in case a body reaches the end of the line before it can be placed upon the chassis.

Two tramways are used, one for each body and chassis line, to transfer the body to the latter. Body sheet metal cleaning, painting and drying are all performed on conveyors.

Assembled cars as they come off the final assembly line pass on to the chassis rolls immediately ahead of the production line and then to the final lines, from where they go to storage, immediately ahead; to the export crating department or to the drain pits for domestic rail shipments. The drive-away ramp also is located fairly close to the end of the final lines so that the floor may be kept as clear of cars as possible.

# NEW DEVELOPMENTS—Automotive

## Lo-swing Model U Automatic Lathe

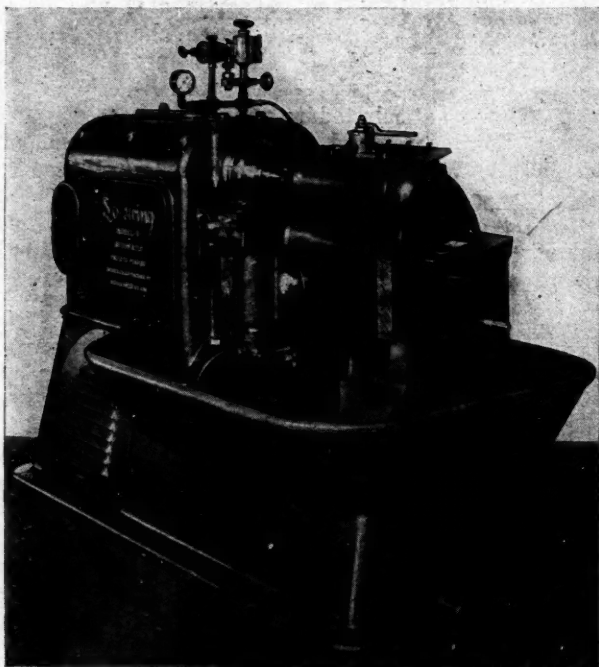
**A**N automatic Lo-swing has recently been developed by Seneca Falls Machine Co., Seneca Falls, N. Y. The machine is known as the "Lo-swing Model U Automatic" and has been made a companion machine to the large Lo-swing Model R Automatic.

The Lo-swing Model U Automatic is designed to machine the lighter types of steering knuckles, stem pinions, side gears, pistons, both aluminum and cast iron, also to do second operation work on some larger parts.

When the machine is started, it makes a complete cycle and stops with carriage slides returned to the

front carriage slide, as well as the cross-feed movement of the rear forming and squaring slide, are obtained by cams which are hardened and ground.

The machine will take work 5 in. in diameter and 12 in. long, weighs approximately 5000 lb., and is so arranged that the new automatic loading devices being developed by the Seneca Falls Machine Co. may be applied. Some of these devices will be announced within the next few weeks.



*View of Lo-swing Model U Automatic Lathe*

starting position. A single lever brings the tail stock center into position and starts the machine in operation. It is necessary, however, to give this lever a distinct and separate movement in order to start the machine. This is done to avoid accidental starting.

When the machine is equipped for individual motor drive, the motor is mounted in the base of the machine. Drive can be by belt or silent chain and is entirely inclosed. Pick-off gears are provided for changing both speeds and feeds.

Ball and roller bearings are provided for all shafts, including the main spindle, so that if desired, the high speeds required by the latest developments in cutting tool materials may be obtained. All the cams, gears and other mechanism in the head-end are automatically lubricated by means of a force feed pump which floods all moving parts with oil.

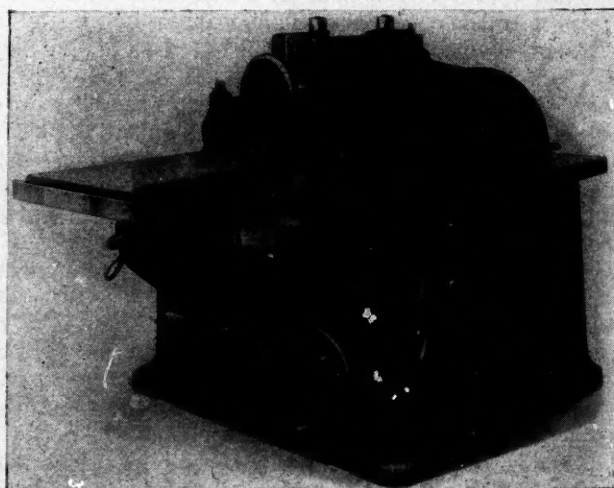
The way on which the carriage travels on the bed is equipped with a hardened and ground steel plate the same as all Lo-swings.

The longitudinal and cross-feed movements of the

## Fay & Egan Ripper

**A** NEW all-electric high-speed straight-edge ripper, called the Model 9-9-9, is introduced by J. A. Fay & Egan Co. One of the outstanding features of this machine is a complete built-in force feed lubrication system, operating at 250 lb. pressure, and starting and stopping with the machine. Return piping from the various bearings have visible drips at the base of the machine, where an electric light bulb is installed so that a glance can determine whether sufficient lubrication is being received by the various bearings.

The traveling feed chain has two inverted Vee-shaped grooves fitting on the chain guides. These guides are lubricated along with the bearings by the force feed system. To prevent short pieces from lodging in the table opening where the chain turns downward, a safety table is provided which permits the piece to drop to the floor, after which the table returns to its original position. The feed roll unit is carried on two heavy slides, and adjusted by a hand wheel through two raising screws mounted in ball bearings. The feed rolls themselves turn on roller bearings and are separately lubricated by a pressure grease gun. The hinged door giving access to the saw, when closed, acts as a dust spout for the exhaust.



*Fay & Egan high-speed straight-edge ripper*



# Parts, Accessories and Production Tools

Directly in front of the infeed roll a line-up finger is provided to assist the operator in edging and cutting out knot holes and other imperfections on long boards. Saw and feed motors are electrically interlocked so that it is impossible for the operator to start the feed without first starting the saw, preventing damage. An idler is provided to carry the weight of the returing chain below the feed table, and an adjustment is also provided by means of which the chain may be made to travel a slight curve so as to produce hollow or straight joints as desired. The machine has a capacity for ripping up to 4 in. thickness, with a 14-in. saw, and has a maximum distance from the saw to the right fence of 21 in., and to the left of 26 in. The tool is regularly furnished with a 15 hp. 3600 r.p.m. motor for either two or three phase 60-cycle current up to 550 volts. For unusually heavy work a 20 hp. motor may be furnished. An 11 in. jointing saw is included in the standard equipment.

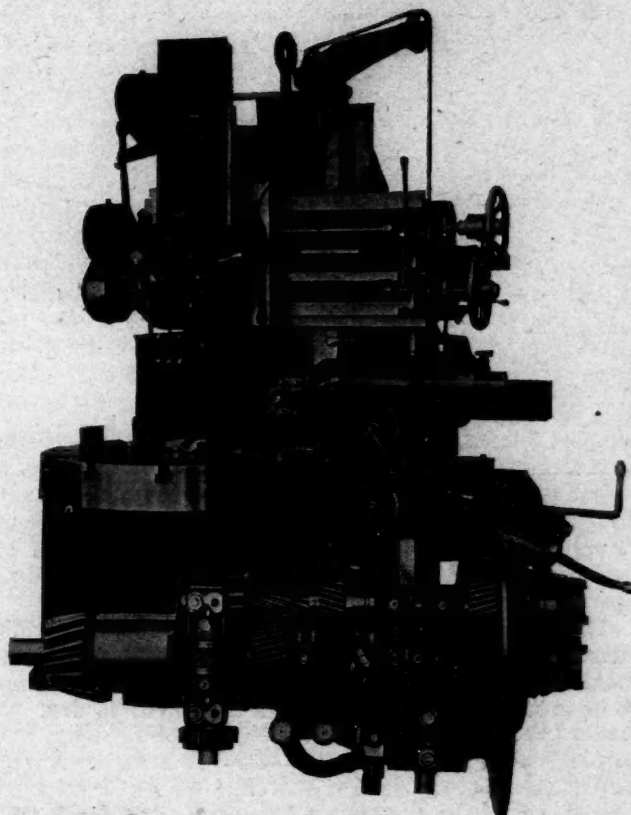
This secondary case combined with the standard primary of Bullard construction provides variously eight and 12 different rates of speed through the respective sizes of machines in which it is applied. The new table speeds obtainable through this unit, though varying with each size of machine, offer reasonable minimum

## Holzapfel Compression Indicator

**T**HE instrument illustrated herewith is a compression indicator for internal combustion engines that is manufactured by G. L. Holzapfel, Houston, Tex. The gage is mounted on a body in which there is a valve of special design. When the engine is being turned over with the spark cut off from the cylinder to be tested, gas is pumped into the space above the valve, and pressure built up there which is retained until it is released. The accuracy of the instrument therefore depends only on the accuracy of the gage itself. About four compression strokes are required before a reading can be taken. The compression pressure shown is not that of a single compression but the means of a series of compressions. In addition to being used in garages and repair shops, the instrument is suitable also for use in factories and laboratories.



Holzapfel indicator



Bullard 42-in. vertical turret lathe showing details of the new spiral and helical type of secondary speed change case

diameters of work at which tungsten carbide and similar materials can be consistently employed under maximum efficiency of operation.

Within the past year, spindle speeds have been increased and recommended horsepower for motor drive has been raised with adequate strengthening in construction on the various models from 25 to 40 per cent above previous ratings.

## Bullard Speed Change Case

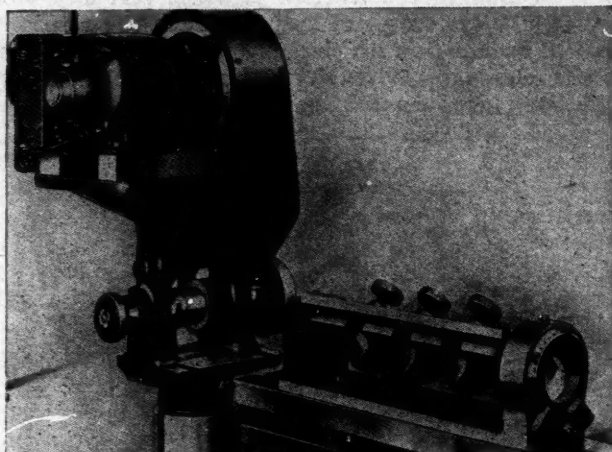
**I**N order to make possible the efficient use of tungsten carbide cutting tools on Bullard vertical turret lathes, the Bullard Co., Bridgeport, Conn., has designed its secondary speed change case with a complete train of spiral and helical gearing properly balanced or controlled in thrust to provide an extremely smooth and powerful flow of work under the cutting tools. The rolling action of spiral and helical gears offers a stronger gear tooth for the same pitch and a more constant flow of power through the driving train to the table.

## Roller-Smith Switches

**T**HE Roller-Smith Co., 233 Broadway, New York City, has developed a new line of oil switches and circuit breakers, known as Type O, and which are made in capacities from 200 to 2000 amp., from 2500 to 15,000 volts, and with interrupting capacities from 20,000 to 40,000 KVA. They are made as two-pole and three-pole devices, automatic and non-automatic, single and double throw, for switchboard, wall and cell mounting, and also for hand, normal and remote control and electrical operation.

## Cincinnati Grinding Attachment

THE Cincinnati Milling Machine Co., Cincinnati, Ohio, has developed a new attachment to be used with its No. 1½ plain cutter and tool grinder for regrinding the wearing surfaces of centerless grinder



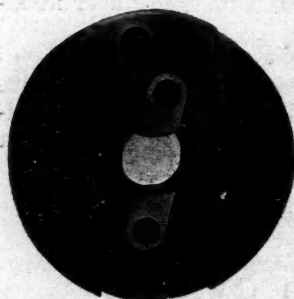
*Cincinnati fixture for regrinding of centerless grinder support blades*

support blades. The attachment grinds the wearing surfaces of all standard support blades for the Nos. 2, 3 and 4 centerless grinders manufactured by Cincinnati Grinders, Inc. The time required to make the set-up is only two minutes and support blades are finished all over, except the wearing surface prior to this grinding operation.

The fixture is made of aluminum and is very rigidly constructed. It will enable support blades with the maximum length of 16⅞ in., ¾ in. wide and 4 in. high to be ground at any angle from a flat top to 45 deg.

## Seneca Falls Driver

THE Seneca Falls Machine Co., Seneca Falls, N. Y., has been for about two years supplying their customers with a patented automatic driver which eliminates the necessity for dog-



*Seneca Falls driver*

ging work. This driver has worked so satisfactorily that it is being placed on the market and is now available to anyone needing this type of driver.

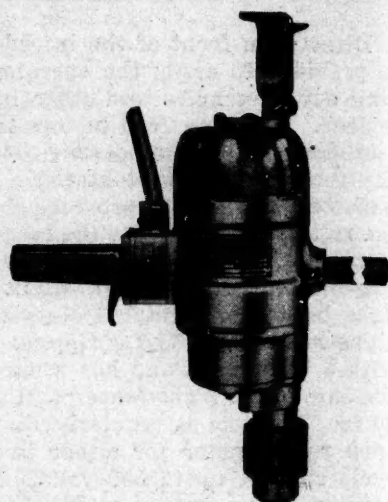
The arrangement of the driver is such that it may be applied to any machine by the use of a chuck plate similar to that used in applying standard chucks to lathes.

As will be noted in referring to the illustration, the work is gripped by means of two corrugated jaws, the corrugated surface being somewhat eccentric to the pivoting point. These jaws are mounted in a slide which is free to float in a transverse guide in the driver-head so that, regardless of whether or not the work is properly centered, there is no danger of putting an excessive amount of pressure on the head center. The construction of this driver is fully covered by letters patent.

## Van Dorn Electric Drill

THE Van Dorn Electric Tool Co., Cleveland, Ohio, announces a new ¾-in. electric drill equipped with a chuck for straight shank bits and drilling capacity of ¾-in. steel. It is driven by a Van Dorn built motor equipped with ball bearing armature and automatic safety switch. The Universal motor is furnished for 32, 110, 220 or 250-volt AC and DC.

The new tool is adapted for heavy drilling work, is very rugged in construction and has great power at low speed.



*Van Dorn ¾-in. electric drill*

## Moto Vox Warning Signal

MOTO VOX, the latest product of the Moto Meter Co., Inc., Long Island City, N. Y., differs from the conventional electric warning signal not only in construction but in its location on the car. It is intended for installation in front of the radiator. It is designed for attachment between the crossbar of the headlamps



*Moto Vox installed on headlamp crossbar*

or to the license bracket rod, or it can be included in the radiator assembly by the use of especially designed radiator gaskets.

Not only has the new product decorative possibilities, but by placing the signal outside the car, the effectiveness of its warnings is considerably increased. The construction of the Moto Vox makes it weatherproof. The electrical mechanism is sealed between two diaphragms and neither ice, snow, mud, water nor dust can hinder its operation.

## Four-Wheel Drive for Fords

ANNOUNCEMENT is made by the Dual Duty Company, Alma, Mich., of the introduction of a four-wheel-drive unit for converting Ford trucks into six-wheel vehicles. Particularly adapted for dump body and tractor truck work, the new unit is featured by its simplicity of installation. There is no supplementary frame, the rear axle of the unit is the stand-



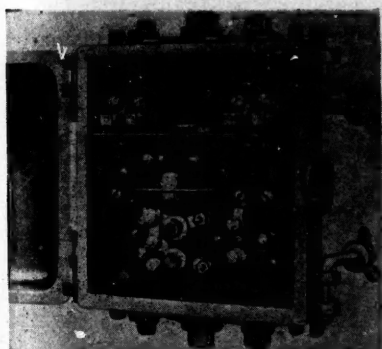
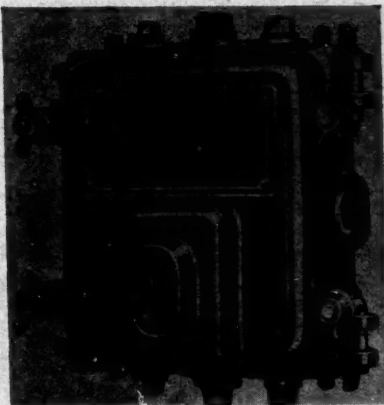
ard Ford axle, and the springs, with the addition of five leaves, are mounted in the original position of the frame.

The only change in the Ford rear axle is the mounting of a large diameter chain sprocket on the inside of the brake drum face. A similar sprocket is secured to the wheels on the forward axle, the two axles being fairly close coupled to keep down the chain length.

The forward axle is of the non-rotary type. Its main attachment to the frame is by means of the front spring shackle, which is attached to this unit rather than to the frame as in the Ford truck construction. Horizontal and vertical motion is permitted by one radius rod and horizontal motion only by the other, providing flexibility for road irregularities. The radius rods are attached to the front axle in castings by large bolts and to the frame in brackets with 2 in. ball joints. They are adjustable for length, moreover, to permit of wheel alignment.

## Automatic Starters

CUTLER-HAMMER, INC., 93 Twelfth Street, Milwaukee, Wis., has developed a dust-tight enclosing case for its across-the-line automatic starters. The enclosures are built in two types: for motors up to 5 hp. and for larger motors. This new equipment does not replace Cutler-Hammer standard dust-proof enclosures, but is offered as an option for installation in places where the large amount of



Closed (above) and open (left) views of Cutler-Hammer dust-tight enclosing cases for automatic starters

dust in the air may interfere with the efficient operation of the starter.

## NATCO Multiple Spindle Driller

THE National Automatic Tool Co., Richmond, Ind., has developed a Model D13H standard NATCO adjustable multiple spindle drill equipped with hydraulic feed. This machine has been designed for a large variety of work, is flexible in its operation and has simplified control.

Three types of heads are made for the machine; two rectangular heads arranged for either 22 or 24 spin-

dles and an 18-in. round head arranged for 12 spindles. Both are of standard NATCO design, with patented independent change of speed to each spindle and with neutral position for spindles not in use. All gears are hardened and running in oil, while the joints are of the improved pattern and constructed of alloy steel hardened and ground throughout.

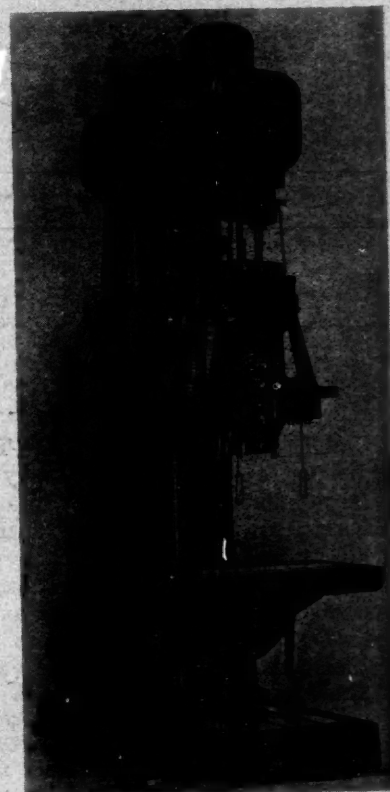
The two 5-in. low pressure oil cylinders of the hydraulic feed are mounted in heavy brackets at the top of the column. The maximum combined pressure of these cylinders is 8000 lb. and is applied directly to the head flange itself. Control of the feed is simple and positive and designed to leave a minimum of work for the operator. Rapid down, feed, rapid up, and stop are controlled automatically by adjustable trip dogs located on the left-hand head clamp.

The pump and oil reservoir are located on and in the top of the column, the pump being driven through a gear from the main drive shaft. A constant speed pump is used which is equipped with a by-pass to allow excess oil to return to the reservoir when a given pressure has been reached.

The machine is furnished with direct motor drive, applied to a horizontal shaft mounted in ball bearings, to a train of heavy-treated alloy steel change gears, then to a set of heavy heat-treated alloy steel spiral bevel gears direct to the head proper.

Vertical adjustment of the arm is made by loosening the adjusting nut, which allows the steel clamp bar to rock on the steel fulcrum, and then the spindle bearing is slid on the arm to the proper position. The total vertical adjustment is 2 in.

The maximum travel of the head is 19 in. Power feed ranges from 0 to 15 in. per minute; power rapid traverse speed is 90 in. per minute; floor space required for machine is 34 by 85 in., and its weight approximately 11,000 lb.



Natco Model D13H Driller

## G. E. Switch

A NEW switch, CR-7006-F-1, recently announced by General Electric Co., Schenectady, N. Y., takes the place of the magnetic switch, motor circuit switch and enclosed fuses usually required in controlling the operation of a motor. This switch can be applied to control any motor where a general purpose magnetic switch would be used and where its special features are desirable. It is compact, easily accessible and readily installed.



First with  
the News

Reliable,  
Accurate

# News Industry

PAGE 960

VOLUME 60

Philadelphia, Saturday, June 22, 1929

NUMBER 25

## Production is Maintained at Record Rate for June

PHILADELPHIA, June 22—The automobile industry has entered the third week of June with heavy manufacturing schedules prevailing at a large number of the factories and there are indications that the seasonal recession in production, long anticipated for the final days of this month, will not be as pronounced as previously estimated. While it is true that several well-known manufacturers who are preparing to introduce new models this summer are—as a consequence—operating on greatly reduced schedules, other makers continue to maintain heavy schedules to meet the present demand, and because of the favorable outlook.

The total output for this month undoubtedly will establish a new June record, exceeding that of 425,195 units manufactured in 1928. Factories now preparing for the production of new vehicles have indicated plans for high output schedules in July. This proposed heavy production will largely offset the decline which will be experienced by certain of the other manufacturers who have been operating at capacity since the introduction of new models several months ago. With such plans in prospect, it appears likely that a new output record will be set for the month of July this year. Reports from the field indicate that, while there is a substantial stock of new cars on hand, the demand is well sustained. Used car stocks remain heavy as the result of trade-in transactions accompanying new car sales. Demand for this class of merchandise, however, is improving.

### Pierce-Arrow Approves Deal With Studebaker

NEW YORK, June 19—The Pierce-Arrow Motor Car Co., at a meeting of the board of directors yesterday, unanimously approved the offering of the Studebaker Corp. to exchange stock on the basis of 2½ shares of Pierce-Arrow Class A for one share of Studebaker common. Deposits of Pierce-Arrow stock are to be made on or before Sept. 12.

In a statement issued to stockholders by the board of directors it was pointed out that this exchange will be advantageous because it will place their stock on a dividend basis, approximately equivalent to \$3.28 a share on present Class A stock and they will own stock which is not subject to redemption as is the present Class A Pierce-Arrow stock.

### Georgia Road Users Back State Highway Bond Issue

WASHINGTON, June 20—The road users of Georgia, cooperating with the Joint Committee for Highway Bonds, are sponsoring a fight to have the Legislature convening June 26, submit to the people of Georgia a referendum proposing a \$100,000,000 state highway bond issue, to be paid for out of motor vehicle registration and gasoline taxes.

According to Norman Damon, of the Washington office of the National Automobile Chamber of Commerce, who surveyed the highway situation at the request of a Georgia newspaper, the "pay-as-you-go" plan in use by the state for 10 years, has been responsible for only about a fourth of the state highway system being paved, and that the counties were responsible for about a third of this total.

### G. M. Delivers 214,870

NEW YORK, June 21—General Motors dealers delivered to consumers during May 214,870 cars, according to announcement made by Alfred P. Sloan, Jr., president of the General Motors Corp. This compares with 224,094 in May of last year and with 223,303 in April of this year. Manufacturing divisions delivered to dealers during the month 220,277 as compared with 207,325 in the corresponding month a year ago and with 227,718 in April of this year.

### R. E. Olds Co. to Build

DETROIT, June 19—The R. E. Olds Co. will erect a 20-story building in Lansing, Mich., to house the Capitol National Bank, of which Mr. Olds is president.

### U. S. Cars Number One for 5.6 Persons

WASHINGTON, June 20—The ratio of passenger cars registered in the United States to population is one car to every 5.6 persons, or 179 per thousand, according to figures compiled by the Automotive Division of the Department of Commerce based upon world motor vehicle registration statistics. The ratio of world passenger cars to world population is one car to every 70 persons or 14 cars per thousand persons.

### Durant Returns to U. S.; Scores Board Further

NEW YORK, June 19—In a statement issued on his return from an eight weeks' trip in Europe, aboard the S. S. Majestic yesterday, William C. Durant continued his excoriation of the policy recently followed by the Federal Reserve Board in attempting to curb excessive lending of the country's financial resources for use in the speculative stock market.

"Confidence will not be restored and the investing public will not again feel secure until the power of the Federal Reserve Board is clearly defined by Congressional action," Mr. Durant said.

### McAneeny Defines Demand

DETROIT, June 22—"I do not believe that it is within the power of man to say that demand for any necessity is limited," said W. J. McAneeny, president of the Hudson Motor Car Co., in his first statement since he was elected Hudson's president at the meeting of the company on April 10.

"That depends upon the purchasing power of the dollar, and the more we can increase that purchasing power the greater the demand will be," the executive continued. "Automobiles, for instance, are today sold for lower prices than ever before and their value has increased immeasurably. When we admit there is a limit to production, progress will stop."



## Election is Held by United Tractor

### Anderson is Renamed Head of Huge Cooperative Organization

CHICAGO, June 20—Milton W. Anderson, of Chicago, was reelected president of the United Tractor and Equipment Corp., comprising 40 prominent makers and distributors of tractors, farm implements, and industrial equipment at the annual directors' meeting, held June 19, in the office of the Allis-Chalmers Manufacturing Co., at Milwaukee.

W. B. May, president of W. B. May, Inc., Buffalo, was elected vice-president; E. R. Wehr, vice-president of the Wehr Co., Milwaukee, was elected secretary-treasurer, and H. T. Enns, Jr., Chicago, assistant secretary-treasurer. Directors were elected as follows: H. C. Merritt, Allis-Chalmers; Water H. Stiemke, Trackson Co., and E. R. Wehr, all of Milwaukee; Arthur S. Hughes, the Hughes-Keenan Co., Mansfield, Ohio; Dunbar Abston, Dealers' Equipment Co., Memphis, Tenn.; A. W. Logan, Motor Power Equipment Co., St. Paul; C. V. Ruble, Universal Equipment Co., Kansas City, Mo.; W. B. May and Milton W. Anderson.

The election of officers ended a day spent by stockholders and directors from 22 states and Canada in inspecting various products of the United line, and in going through the newly-completed special factory in which the Allis-Chalmers company on Aug. 1 will begin increased quantity production of the United Tractor for the members of the corporation.

### Hudson Exports Gain

DETROIT, June 19—Exports of the Hudson Motor Car Co. for the first five months of the year show a gain of 18 per cent over the corresponding period of last year, the best previous period in the company's history. This would indicate that the record established last year will be broken by a substantial majority, according to J. S. Draper, general export manager for Hudson.

### Reifsnider to Join Mather

TOLEDO, June 19—J. M. Reifsnider, general manager of the Page Steel & Wire Co., Adrian, Mich., for the last seven years, will resign on July 1 to become general manager of the new bumper plant of the Mather Spring Co., to be built within the next few months on a site purchased a few weeks ago.

### Gear Makers Plan Meeting

CLEVELAND, OHIO, June 17—At a recent meeting of the executive committee of the American Gear Manufacturers Association at New York, all old officers were reelected as follows: president, A. F. Cooke, vice-president of Gears & Forgings, Inc., Pittsburgh

branch; first vice-president, B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, R. I.; second vice-president, E. W. Miller, Fellows Gear Shaper Co., Springfield, Vt.; treasurer, Warren G. Jones, president, W. A. Jones Foundry & Machine Co., Chicago. It was decided to hold the fall meeting at Briarcliff Lodge, Briarcliff Manor, N. Y., Oct. 24-26.

### E. G. Budd Mfg. Co. Plans to Pay Div. on Common

PHILADELPHIA, June 20—Payment of a regular quarterly dividend of 25 cents per share on the common stock of the Edward G. Budd Mfg. Co., as of Aug. 1, to stockholders of record July 15, was decided upon at a directors' meeting held Tuesday, June 18. An extra dividend of 25 cents per share will be paid at the same time.

Increasing the common stock of the company under the recent announcement will add about \$6,000,000 to the working capital of the company, making it possible to pay all bank indebtedness, pay up to Aug. 1, 1929, all sinking funds on preferred stock, and to pay up to Aug. 1, all dividends on preferred stock, to stockholders of record July 15. Completion of financing and completion of the above program will leave the company free of bank indebtedness, and with substantial bank balances, in the face of its best manufacturing year, according to Edward G. Budd, president.

### Producing Whippet Bodies

TOLEDO, June 20—Commercial unit bodies for the Whippet truck chassis are being produced by the Shop of Siebert, Toledo; Hercules Products, Inc., Evansville, Ind.; the Martin-Parry Corp., York, Pa.; the Montpelier Body Corp., Montpelier, Ohio, and others. These bodies may be purchased through representatives of the body companies.

### Weatherproof Buys Plant

DETROIT, June 19—The plant formerly used by the Field Body Corp. at Owosso, Mich., has been purchased by the Weatherproof Body Corp., of Corunna, and will be operated as a second unit of the Corunna factory. The company manufactures truck cabs, wood parts for automobile bodies, and bodies for commercial vehicles.

### Reo Has English Branch

DETROIT, June 20—The Reo Motor Car Co. has established an English subsidiary which will operate as a distributing branch to serve the Reo English trade, according to C. E. Eldridge, general sales manager. The British company will not manufacture or assemble cars.

### Packard Split-Up Approved

DETROIT, June 19—Stockholders of the Packard Motor Car Co. have approved the five to one split-up of stock. New certificates will be ready for delivery Sept. 3.

## Production in May is Fixed at 635,528

### Government Figures Show Record Truck Output of 93,026 Units

WASHINGTON, June 21—The total May production of passenger cars and trucks in the United States and Canada was 635,528, according to figures compiled by the Department of Commerce from reports of 151 manufacturers in this country and from the Dominion Bureau of Statistics.

The May output shows a decline of 27,704 units from the all-time production record of 663,232 established in April of this year. It exceeds the production of 459,725 for May, 1928, by 175,803 units, however. Truck production last month set a new record with an output of 93,026 units.

Production for the first five months of 1929 was 2,844,650 units, compared with 1,901,314, in the corresponding period last year, a difference of 943,336 units.

The following table is based on the Department of Commerce report and shows revised figures for January, February, March and April of this year:

1928			
	Cars	Trucks	Total
Jan. ....	212,351	27,840	240,191
Feb. ....	301,466	34,834	336,300
Mar. ....	387,048	43,735	430,783
Apr. ....	385,394	48,921	434,315
May ....	405,627	54,098	459,725
Total....	1,691,886	209,428	1,901,314
June ....	381,963	43,232	425,195
July ....	358,914	58,398	417,312
Aug. ....	424,867	67,676	492,543
Sept. ....	375,463	61,044	436,507
Oct. ....	353,162	62,668	415,830
Nov. ....	*225,608	*43,401	*268,909
Dec. ....	*212,727	*30,814	*243,541
Total....	4,024,590	576,551	4,601,141
1929			
Jan. ....	*368,610	*55,927	*422,537
Feb. ....	*433,400	*64,239	*497,639
Mar. ....	*548,178	*77,536	*625,714
Apr. ....	*573,303	*89,929	*663,232
May ....	542,502	93,026	635,528
Total....	2,463,993	380,657	2,844,650

\* Revised.

### Miniger and McIntyre Buy Napoleon Stamping

TOLEDO, OHIO, June 19—Control of the Napoleon Stamping Co., Napoleon, Ohio, maker of automotive stampings, was purchased today by C. O. Miniger, president of the Electric Auto-Lite Co., and C. S. McIntyre, president of the Monroe Equipment Co. A new plant will be built near Monroe, Mich., on a tract of land purchased by a group headed by Messrs. Miniger and McIntyre.

The Napoleon Stamping Co. was founded by Sidney Thompson, of Defiance, Ohio, four years ago.



## Chevrolet Reports Sales of Used Cars

### New Record Made in May With 157,624 Units Marketed

DETROIT, June 22—The nation-wide Chevrolet dealer organization sold 157,624 used cars during the month of May, in addition to establishing a record volume for new car business, Chevrolet officials announced today. This is believed to be a new record for sales of used cars in a single month by the dealer organization of one factory.

In commenting on the achievement, Chevrolet officials pointed out that it was made possible through the tremendous amount of public confidence that has been built up by Chevrolet dealers through the general policy of offering only dependable merchandise for sale. It was explained that through the use of a standardized red tag "with an O.K. that counts" prospective used car buyers could be assured that every vital part of the car they bought had been properly reconditioned.

The May total of used car sales showed a gain of more than 33 per cent over sales of used cars for May a year ago when 118,195 used cars were sold and also surpassed the April, 1929, record of 133,887 used cars sold.

## Firestone Battery Co. Incorporated in Del.

AKRON, OHIO, June 18—The Firestone Battery Co. has been incorporated in Delaware as a subsidiary of the Firestone Tire & Rubber Co. Contract has been awarded for the erection of a \$500,000 plant for battery manufacture and work on the new building will begin immediately.

The plant will have a capacity of 2000 batteries daily and approximately 1000 men will be employed when it is completed. Completion of the first unit is scheduled for early in July, and equipment and machinery will be moved in at once.

## Duesenberg Outlook Bright

INDIANAPOLIS, June 18—Duesenberg, Inc., a unit of Auburn, reports that it is maintaining production at the rate of one and one-quarter cars daily while orders are coming in at the daily rate of two and one-half cars. Orders on hand are said to be sufficient to keep the factory working at capacity for the rest of the year.

## Show Reservations Made

PARIS, June 15—With 28 booths reserved, the United States is almost on an equality with France and has a stronger representation than all other foreign nations combined, in the Paris Automobile Salon to be held in the Grand Palais, Oct. 3 to 13. The American firms include Packard, Willys-

Knight, Stearns-Knight, Chrysler, Pierce-Arrow, Studebaker, Hudson, Essex, Ford, Cadillac, Chevrolet, Graham-Paige, Hupmobile, Reo, Jordan, Nash, Durant, Auburn, Dodge, Marmon, Stutz, Buick, Moon, Lincoln, Franklin, Oldsmobile, Oakland and Whippet.

## Ohio Shows Slight Drop

COLUMBUS, OHIO, June 17—The Ohio Council, National Automobile Dealers' Association in a bulletin covering sales of new cars in eight of the most populous counties in Ohio during May shows a decline from the high records of April, which was the banner month of the year as far as sales are concerned. In the eight counties there were 18,425 new passenger cars sold as compared with 21,471 in April. But the sales in May were 27 per cent greater than those of May, 1928. Sales of passenger cars in the eight counties during the first five months of the year numbered 73,182, which was 48 per cent greater than those of the corresponding period last year.

## Fordyce B. Caswell

Fordyce B. Caswell, vice-president and director of sales of the Champion Spark Plug Co. since 1912, died suddenly in a Toledo hospital Friday night, June 14, from a heart attack following a minor operation. He was 61 years of age.

Mr. Caswell, one of the best known figures in the automotive field by reason of his long connection with the Champion company and his prominence in many of the industry's organizations, was regarded as one of the ablest and most aggressive sales managers in the country.

## N.A.C.C. Opposes Duty

WASHINGTON, June 20—The National Automobile Chamber of Commerce, through its legislative committee headed by H. H. Rice, treasurer of the chamber, has joined with the American Automobile Association in requesting the Senate Finance Committee to eliminate from the tariff act the section which provides that American automobiles purchased abroad shall be subject to reimportation duties when brought back to this country by any other than the exporter.

## Denmark Grants Subsidy

WASHINGTON, June 20—An annual subsidy of 250,999 crowns (\$67,000) for two years has been officially granted the Danish Aeronautic Company, according to a dispatch received by the Department of Commerce this week from Commercial Attache H. Sorenson at Copenhagen.

## Hupp Exports Gain

DETROIT, June 19—The Hupp Motor Car Corp. has reported that its export shipments for the 12 months ended May 31, 1929, totaled 4711 cars, as compared with 4301 during the corresponding previous period, a gain of 410 cars.

## Cord Corp. Formed by Auburn Leaders

### New Organization Will Co- ordinate Various Auto- motive Interests

NEW YORK, June 21—Formation of the Cord Corp., with an indicated capital of \$125,000,000, as a management-holding corporation, has been announced by E. L. Cord, president of the Auburn Automobile Co. Mr. Cord and a few of his associates have exchanged their entire holdings in the automobile industry for the stock of the new company.

Management of the Cord Corp. will be entirely in the hands of the men who have been responsible for the growth and development of the Auburn Automobile Co. and its affiliated interests for the last five years. Management of the corporation will rest with an executive committee composed of E. L. Cord, chairman; L. B. Manning and R. S. Pruitt. Officials of the corporation will be: E. L. Cord, president; L. B. Manning, vice-president; R. S. Pruitt, secretary, and Hayden Hodges, treasurer.

Directors of the new organization will include the following: E. L. Cord, president, Auburn Automobile Co.; L. B. Manning, president, Manning & Co., investment bankers; J. H. McCormick, president, Lycoming Manufacturing Co.; Fred S. Duesenberg, vice-president, Duesenberg, Inc.; R. H. Faulkner, vice-president, Auburn Automobile Co.; Ellis W. Ryan, vice-president, Auburn Automobile Co.; B. D. DeWeese, president, Saf-T-Cab Co.; R. S. Pruitt, secretary and general counsel, Auburn Automobile Co.; J. D. Bobb, president, Limousine Body Co., and P. P. Willis, president, P. P. Willis, Inc., advertising.

Mr. Cord explained that the principal reason for the organization of the corporation is to concentrate the holdings of himself and his associates in a single company so departmentally organized as to afford close coordination and management of the many interests involved at present and those of any additional companies that may be acquired in the future. A complete management organization is to be maintained with headquarters in Chicago.

## Sloan Gives Luncheon

NEW YORK, June 18—Alfred P. Sloan, Jr., president of the General Motors Corp., tendered a farewell luncheon today at the Savoy-Plaza to the managing directors and regional directors of the export organization of General Motors who are returning overseas after attending the first Managing Directors Conference which has been in progress for the past month. James D. Mooney, vice-president of General Motors and president of the General Motors Export Division, presided and introduced Mr. Sloan.



## Output Still High in Steel Industry

### Reported Formation of Tin Cartel in London Arouses Interest

NEW YORK, June 20—Seasonal conditions are beginning to affect the steel industry in a more marked degree than has been the case recently despite the fact that fresh commitments by automotive consumers, aside from Ford, show marked shrinkage, leading producers of full-finished automobile sheets continue to operate at a high rate, specifications on their books permitting them to maintain a brisk production pace.

The warm weather is felt to some extent in finishing departments. Some uneasiness is felt lest increased shipments to consumers other than those in the automotive industries may lead to requests for postponements, for after all there is a pretty close tie-up between business conditions in general and those in the automotive field.

The chief topic of discussion in the market this week was the reported formation of a huge tin cartel in London, for the avowed purpose of "stabilizing" the price of tin at the equivalent of 57½ cents, approximately 27½ per cent above the prevailing market. It is generally estimated that the automotive consumption of tin in 1929 was at a better rate than 20,000 tons a year. An increase in price, such as that contemplated in the proposed "stabilization," would add some \$5,500,000 a year to the automotive industries' tin bill. A similar amount would be added to the steel manufacturers' bill for tin used in the manufacture of tin plate, so that it is easy to see why the news from London stirred up considerable excitement in the market.

Veteran operators in the tin market expressed the opinion that if the cartel succeeded in lifting the tin market to 50 cents, it might consider having done a good job and let it go at that. It is significant that complete details pertaining to the cartel were furnished by a New York banking house. It is freely admitted that the Dutch East Indian Government, which holds the balance of power in the tin market by reason of its control of the supply of Banka tin, is holding aloof from the movement, and it will be remembered that similar aloofness on the part of the Dutch, when it was sought to bring the world's rubber producers under one hood, was the first nail in the Stevenson scheme's coffin.

**Pig Iron**—Sales to automotive foundries consist largely of fill-in lots. The market generally rules steady with prices at the leading centers maintained at unchanged levels.

**Aluminum**—Tapering-off in the demand from automotive consumers is noted in the Cleveland and Detroit markets. Aircraft builders are reported to be taking larger quantities of special alloys. While the

## China Lowers Duty on Truck Chassis

WASHINGTON, June 20—A new customs ruling by the Chinese Government lowers the import duty on motor truck chassis from 22½ per cent ad valorem to 12½ per cent ad valorem, according to a radio report received by the Department of Commerce this week from Trade Commissioner A. Viola Smith in China.

aggregate demand from this source is relatively small, every slight increase is noted with considerable satisfaction. The tariff on aluminum is expected to be brought up in the Senate. The market remains quotably unchanged.

**Copper**—"Independent" consumers appear to be well covered over the next two months, and pending their reentering the market, the major influences are exports and the course of copper stocks in Wall Street. Optimistic views entertained by brokerage houses that copper producers can easily better their dividends so far have not influenced consumers greatly in their purchasing programs.

**Tin**—On the news of the impending information of a British tin cartel, the market moved close to 45 cents which price level is looked upon as a very reasonable one for the metal.

**Lead**—Firm with good demand from all classes of consumers.

**Zinc**—Steady at 6.65 cents, East St. Louis, and 7 cents, New York.

## Fafnir Bearing Co. Buys Railway Motors Corp.

NEW BRITAIN, CONN., June 15—Announcement is made by the Fafnir Bearing Co. of its entrance into the railway equipment field through the purchase of the Railway Motors Corp., of De Pere, Wis., maker of a roller bearing for journal applications. The Railway Motors Corp. has been engaged in the development of anti-friction bearings for railroad equipment.

The Fafnir Bearing Co. will manufacture these bearings as the "Fafnir-Melcher Roller Journal-Bearing." For the present the manufacture will be conducted at the Railway Motors Corp. plant in De Pere, but production will ultimately be concentrated in New Britain. L. W. Melcher, designer of the bearing, will continue to have charge of sales and service, with headquarters in Chicago.

## Franklin Reports Record

SYRACUSE, N. Y., June 18—The Franklin Automobile Co. reports that retail deliveries for May established the greatest volume of business for any single month in the history of the company. Increases ranged from 100 to 600 per cent in various parts of the United States and Canada. On June 14 the company shipped its 7768th car since the first of the year.

## Shipments of Tires Increase in April

### Rubber Mfrs. Assn. Report Shows Heavier Balloon Tire Demand

NEW YORK, June 18—Increased demand for balloon tires is shown by April production and sales figures of the Rubber Manufacturers Association as just prepared. Shipments of balloon casings during April of this year nearly doubled shipments in April of last year and were somewhat in excess of March of the current year.

Production also continues above all preceding months with the result that inventories at the close of April were practically twice inventories at the close of April last year. These are also above inventories for the close of March this year.

Inner tubes for balloon tires show increases in production, shipment and inventory over March and over April of last year with the result that in spite of reductions in all classifications of high pressure casings and tubes production, shipments and inventories of inner tubes and casings of all types show marked increases over a year ago as well as a steady growth during the current year. Shipments of high pressure tubes alone exceeded shipments in March, being the only instance where high pressure tires showed any expansion over the older figures.

A study of the following comparative figures will show growth of demand and production in balloon tires. Production, shipments and inventories in all balloon casings are records for the period covered by the association's figures:

#### PNEUMATIC CASINGS—ALL TYPES

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	12,263,316	5,639,436	5,031,101
Apr. 1929....	12,696,808	5,912,854	5,470,779
Apr. 1928....	9,537,796	4,633,308	4,358,831

#### INNER TUBES—ALL TYPES

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	13,312,636	5,599,787	5,053,266
Apr. 1929....	13,600,505	5,725,744	5,373,040
Apr. 1928....	12,479,150	4,995,533	4,275,604

#### BALLOON CASINGS

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	7,858,642	4,299,586	3,863,650
Apr. 1929....	8,346,727	4,601,986	4,123,769
Apr. 1928....	4,983,023	3,309,351	2,983,454

#### BALLOON INNER TUBES

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	7,938,587	4,120,493	3,773,585
Apr. 1929....	8,369,244	4,375,920	3,921,768
Apr. 1928....	6,434,307	3,366,957	2,815,778

#### HIGH PRESSURE CORD CASINGS

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	4,330,747	1,397,657	1,157,188
Apr. 1929....	4,292,167	1,305,224	1,335,121
Apr. 1928....	4,331,499	1,307,759	1,347,854

#### HIGH PRESSURE INNER TUBES

	Inven- tory	Produc- tion	Ship- ments
Mar. 1929...	5,856,289	1,475,822	1,276,490
Apr. 1929....	5,220,167	1,347,128	1,447,504
Apr. 1928....	6,044,843	1,028,578	1,459,828



## More Than Half of Automobile Sales on Instalment Basis, Survey Shows

WASHINGTON, June 19—Slightly more than half of the total volume of automobile business in conducted on instalment credit and the average loss on instalment accounts is less than half as great as than on open accounts, according to the preliminary report, based on a nation-wide survey of retail credit, recently concluded by the Department of Commerce in conjunction with the National Retail Credit Association. Data were compiled on 440 department stores, 339 automobile dealers, and 1097 grocery stores doing a volume of business in excess of a billion and half dollars.

Briefly, the report shows that one-third of department store sales, two-thirds of automobile dealer sales and considerably more than one-half of all grocery store sales were made on credit. Bad-debt losses were found to be comparatively low. The average loss of department stores from this cause was only 0.4 per cent on regular charge account sales and 1.1 per cent on instalment sales; automotive dealers showed a reverse situation with regard to open credit and instalment accounts with losses of 0.9 per cent and 0.4 per cent respectively. Grocery stores numbering 843 which did a credit business showed a percentage of bad debts on charge accounts of 0.6 per cent.

Reports from 339 automobile dealers with total cash and credit sales of \$145,954,000 indicate that 31.6 per cent of this amount was for cash, 17.7 per cent on open credit and 50.7 per cent on instalment credit. A large proportion of the open credit sales was for accessories, it is pointed out.

"There is a direct relationship between size of business and proportion of credit sales; the larger the business the greater the proportion of both open and instalment credit sales," the automobile section of the report states. "The Pacific Southwest States had the highest average of instalment credit

sales and the New England States the lowest; 60.4 per cent of the total sales of the former resulted in instalment accounts as opposed to 42.7 per cent of the latter.

"Computing a credit loss percentage by taking the ratio of total bad debts to total open and instalment credit sales, respectively, it was found that the average loss on open accounts was 0.9 per cent and of instalment accounts 0.4 per cent, or less than half as much.

"The difference between department stores and automobile dealers with respect to losses on open credit and instalment credit accounts is worth noting. Department stores lost less on their open accounts, whereas automobile dealers lost less on their instalment accounts."

Two hundred and eighty-two dealers, or 83.4 per cent, made use of finance companies in financing instalment sales as compared with 56 dealers or 16.6 per cent which did not, the report shows.

The data further show that 309 dealers, or 9.14 per cent, require at least one-third down-payment as against 29, or 8.6 per cent, who sell on sub-standard terms in regard to down-payment. There was little difference shown between the instalment credit losses of the two classes.

There were 283 dealers, or 83.7 per cent, which limited the life of the instalment contract to 12 months or less as opposed to 55 dealers, or 16.3 per cent, which used sub-standard terms. The percentage of bad losses was approximately the same for both groups. Out of a total of 328 dealers, 257, or 78.4 per cent, made use of credit bureaus and 71 dealers, or 21.6 per cent, did not. The dealers which used the credit bureaus had losses on the instalment accounts of 0.3 per cent while those dealers which did not had average losses of 0.4 per cent.

## Chevrolet Adds New Zones; Promotes Branch Managers

DETROIT, June 15—Creation of a new sales region, seven new sales zones and the promotion of several leading sales officials of the Chevrolet Motor Co. were announced today by H. J. Klingler, vice-president and general sales manager. Chevrolet now has nine sales regions, which embrace 52 sales zones. William E. Holler, nationally known automobile sales executive, has been appointed sales manager of the region which will supervise the operations of zone offices in Buffalo, Syracuse, Harrisburg, Baltimore and Richmond.

Headquarters for the seven newly created zones are located in the following cities: Decatur, Ill.; Davenport, Iowa; Amarillo, Tex.; San Antonio,

Tex.; Fort Wayne, Ind.; Harrisburg, Pa., and Syracuse, N. Y.

New managerial appointments are: O. E. Nonn, Decatur; G. I. Smith, Davenport; K. M. Chase, Amarillo; W. E. Cabeen, San Antonio; B. J. Swanson, Fort Wayne; J. L. Murphy, Harrisburg; H. K. Bragle, Syracuse.

## Form St. Louis Aviation Corp.

ST. LOUIS, June 20—The St. Louis Aviation Corp., with a capital of \$3,500,000, has been organized here by a group of bankers including Knight, Dysart & Gamble, Olive J. Anderson & Co., and James C. Willson, it was announced yesterday. Harold M. Bixby will be president of the new company, which has been incorporated in Delaware and will have its headquarters here. The new firm will deal in avi-

ation securities and will aid in the development of commercial aviation, it is explained. It will have full access to the research department of the National Aviation Corp.

## Bendix Aviation Corp. Buys Stinson Patents

CHICAGO, June 19—The Bendix Aviation Corp. has purchased all claims and patents governing the Stinson brake control mechanisms, E. A. Stinson, president of the Stinson Aircraft Corp., of Wayne, Mich., announced yesterday. The transaction was on a cash basis.

The Stinson Aircraft Corp. will continue to manufacture the brake controls under a sales agreement, and Bendix patents and other patents controlled by the Bendix Aviation Corp. may be incorporated in the Stinson design, it was stated.

## To Lecture on Cohesion

PHILADELPHIA, June 19—The fourth Edgar Marburg lecture will be held on the occasion of the annual meeting of the American Society for Testing Materials at Atlantic City on Wednesday afternoon, June 26, at 4 p.m. The lecturer will be Dr. Saul Dushman, assistant director of the research laboratory of the General Electric Company at Schenectady, N. Y. His subject will be "The Nature of the Cohesive Forces in Solids."

## Murray Offers Rights

DETROIT, June 19—The Murray Corp. of America today offered to stockholders of record August 24, rights to subscribe to one new share at \$30 a share for every two and a half shares now held. The rights will expire Oct. 1, and the new stock will be deliverable Oct. 31. An increase of 216,837 shares will be required if the rights are exercised.

## Plane Finance Rule Approve

NEW YORK, June 18—New provisions of the air commerce regulations approved by the Department of Commerce, after joint conference between that body and the Finance-Insurance Section of the Aeronautical Chamber of Commerce, will make it possible for the public to purchase airplanes on the deferred payment plan as automobiles are now purchased.

## "Bosch" Cancellation Upheld

WASHINGTON, June 20—Cancellation of the word "Bosch" as a trademark for electrical devices for motor vehicles was upheld in a decision rendered this week by the U. S. Patent Office. The mark had been registered by the American Bosch Magneto Corp. and cancellation was requested by the Robert Bosch Aktiengesellschaft on the grounds that the registrant had not proved bona fide use of the mark for at least one year in interstate commerce as provided by the Act of March 19, 1920.



## Ford Taxicab Plan Meets Opposition

Independent Operators Propose to Reduce Rates in New York City

NEW YORK, June 19—Ford Motor Co.'s attempt to secure official approval for its four-passenger taxicab for use in New York City met with considerable opposition from existing operators and from manufacturers of cabs now in use at a public hearing held before Police Commissioner Whalen yesterday.

William A. Francis, eastern branch manager for Ford, read into the records a statement citing existing statutes covering the taxicab situation and giving specifications of the Ford cab. He pointed out that the only specification which the Ford cab did not meet was the police regulation covering interior dimensions. Because of its shorter wheelbase the Ford cab would tend greatly to reduce traffic congestion, Mr. Francis contended, being sufficiently short so that three Ford cabs would occupy the space now occupied by two cabs of any existing make.

The hearing was held because of a proposal by a group of independent operators to introduce a fleet of cabs operating at a reduced rate and other operators and cab manufacturers were present to combat approval of the reduced rate. Mr. Francis indicated that Ford was not interested in rates and did not plan to operate a fleet of cabs. He did indicate, however, his belief that whatever rates should be established should be sufficient to guarantee profit to the operator.

The Ford cab, if approved, will sell for about \$850 as compared with \$2,000 to \$2,500 for cabs of the present type. Further hearings were adjourned until next Tuesday.

## Drake and Rice Named on Highway Committee

WASHINGTON, June 20—United States delegates to the Second Pan-American Congress of Highways to be held at Rio de Janeiro August 16-31, were named by President Hoover this week. J. Walter Drake, Detroit, member of the board of the Hupp Motor Car Corp., and a director of the National Automobile Chamber of Commerce, was named as chairman.

The legislative department will be represented on the committee by Senator Tasker L. Oddie of Nevada and Congressman Cyrenus Cole of Iowa. Other members of the committee are Thomas H. MacDonald, chief of the U. S. Bureau of Public Roads; Frank T. Sheets, chief highway engineer for Illinois; Charles M. Babcock, Minnesota Commissioner of Highways; H. H. Rice of the Chevrolet Motor Co. and treasurer of the National Automobile Chamber of Commerce, and Frederick A. Reimer, president of the American Road Builders Association.

## Exports of Planes Show Big Increase

WASHINGTON, June 20—Mexico, Chile and Argentina were the chief purchasers of American-built airplanes during the first quarter of this year, according to the Department of Commerce. Airplanes, seaplanes and amphibians exported to all countries during the first quarter had a value of \$1,103,520, a 100 per cent increase over the corresponding period of last year. The United States imported 23 planes having a value of \$83,804, during the quarter.

## Packard Sells 5400 in May

DETROIT, June 19—The Packard Motor Car Co. has announced that more than 5400 cars were delivered to retail customers in May, establishing a new record for that month in the company's history, and representing the third largest of any month in deliveries. Packard's biggest month was April, 1929, and the second largest was August, 1928. H. W. Peters, vice-president in charge of distribution, has asserted that indications point to another record in June. The company announced its production last month as 4560 cars.

## M. & E.A. Adopts Slogan

NEW YORK, June 18—The Motor and Equipment Association has adopted as its official slogan, "Care Will Save Your Car." It is expected that members will use the slogan together with the M.&E.A. emblem extensively in advertising and various literature. Printed copies to members as well as non-members will be furnished upon request directed to the headquarters of the organization at 250 E. 57th St., New York City, or 35 E. Wacker Drive, Chicago.

## Lycoming Sets New Mark

AUBURN, IND., June 22—The Lycoming Manufacturing Company, Williamsport, Pa., Auburn subsidiary, has broken all its records for production both for May and for the first five months of 1929 with gross sales for May amounting to approximately a million and a half dollars, and a total production of 7519 engines.

## Franklin Earns \$1,046,109

SYRACUSE, June 20—The Franklin Automobile Co. has reported net profit after all charges for the first five months of the current year of \$1,046,109. This is equivalent after preferred dividend requirements to \$2.85 a share on outstanding common stock and compares with earnings of \$230,257 for the first five months of last year.

## May Employment Conditions Favorable

Dept. of Labor Report Shows Accessory Plants Worked Overtime

WASHINGTON, June 20—The automobile industry kept large numbers of skilled workers steadily employed during the month of May and in a number of localities automobile accessory plants worked overtime, according to the monthly bulletin issued this week by the Department of Labor, which includes a survey of industrial employment throughout the country made by the U. S. Employment Service. Favorable employment conditions were also found to exist in the rubber and airplane industries.

Following is a summary of employment conditions in the principal automotive manufacturing centers of the country as reported in the bulletin:

**New York—General:** Automobile plants operated at high level; Buffalo district: Airplane factories operated at capacity; Yonkers district: Employment in automobile industry reached new high level; Jamestown district: Automobile accessory plants worked overtime; Elmira: Decrease in employment in automobile industry.

**New Jersey—General:** Automobile accessory plants added to forces; Jersey City district: Work started on new auto assembling plant at Edgewater; Camden: Accessory plants increased employment.

**Pennsylvania—General:** Automobile and accessory plants worked at capacity with skilled labor shortage; Oil City: Gasoline engine factory employed additional help; Reading: Auto accessory plants employed full forces; Williamsport: Auto industry worked overtime.

**Michigan—General:** Automobile factories employed large forces; Detroit district: Manufacturing plants worked full time and accessory plants overtime; Grand Rapids: Body and bumper plants worked overtime; Flint: Shortage of body workers; Kalamazoo: Auto factories on overtime schedules; Bay City: Large auto factory worked overtime; Lansing: Production schedules of auto factories slightly curtailed.

**Ohio—General:** Rubber tire production at high level; Cleveland: Automobile industry operated at high rate; Cincinnati district: Assembling plants worked overtime; Akron: Tire plants worked three-shift basis; Mansfield: One tire factory closed.

**Illinois—General:** Work started in small automobile factory in Moline district. **Missouri—General:** Employment gained in assembling plants: St. Louis: Normal forces in assembling plants. **Delaware—General:** Airplane industry worked overtime.



# Men of the Industry and What They Are Doing

## Moto Meter Gauge Names Its Board of Directors

Moto Meter Gauge & Equipment Corp. has announced the board of directors of the new corporation as follows: William F. Kenny, member of the board of directors of Chrysler Motor Car Co.; Ex-Governor A. Harry Moore of New Jersey; Charles G. Dawes of Chicago; F. J. Leary, first vice-president of the Central Trust Co. of New York; James J. Riordan, president of the County Trust Co.

Harold Richards, chairman of the board, Manufacturers' Trust Co.; R. J. Martin, president of the Moto Meter Gauge & Equipment Corp.; Victor C. Bell, Mendes, Bell & Whitney; Maurice M. Minton, vice-president of Merlin Products Corp.; John S. Snelham, Deloitte, Plender, Griffith & Co.; Graham Adams of J. A. Sisto & Co., and Lewis F. Stoll, vice-president of McGraw-Hill Publishing Co.

## Glancy Receives Honor

A. R. Glancy, president and general manager of the Oakland Motor Car Co., recently was installed as president of the Alumni association of Lehigh University. Mr. Glancy was graduated from the institution in 1903 as a mining engineer, a profession which he followed for some time after graduation, later becoming a construction engineer. He joined the Oakland organization in an executive capacity five years ago, and was elected to a vice-presidency in General Motors a month ago.

## Thorne Joins Pierce-Arrow

Maurice A. Thorne, who has had charge of the proving grounds of the Studebaker Corp. of America for several years, has become experimental engineer, Pierce-Arrow Motor Car Co., Buffalo. Prior to his connection with Studebaker, Mr. Thorne was manager, research department, *Automotive Industries*. John A. C. Warner now has charge of the proving grounds.

## Faeh Succeeds Beard

A. C. Faeh has been elected executive secretary of the Chicago Automotive Trade Association, succeeding Tim Beard, who has resigned after 18 years' service to devote all of his time to the National Used Car Market Report. Mr. Faeh formerly was assistant general manager of the National Automobile Dealers Association.

## Walker Expresses Optimism

Helm Walker, vice-president and sales manager of the Windsor Corp., who is making a survey of the eastern territory, reports exceptionally good conditions in the automobile industry as a whole and states that the demand for Windsor cars is promising.



**Ernest D. Grinnell**

*Whose appointment as traffic manager of the Buick Motor Co., succeeding George C. Conn, was announced last week in Automotive Industries*

## McIlroy Appoints Watkins

E. A. Watkins, president of the Watkins Mfg. Company, Wichita, Kan., has been appointed to the N.S.P.A. Aeronautical Committee by W. E. McIlroy, president of the N.S.P.A. Mr. Watkins is interested in aeronautical activities, being president of the Central Air Lines, Inc., with headquarters at Wichita, as well as president of the Central Air Lines Flying School.

## G.M. Names Rickenbacker

The General Motors Corp., has announced the transfer of Capt. E. V. Rickenbacker, war time ace, from the sales managership of the LaSalle Division of Cadillac Motor Car Co. to the vice-presidency of the Fokker Aircraft Corp. in charge of sales.

## Parker Returns From Trip

General business and crop conditions that affect motor sales west of the Mississippi are unusually good this year, reports E. R. Parker, vice-president in charge of sales of the Stutz Motor Car Co. of America, Inc., who has just returned from a month's survey of western business.

## J. A. Hammer Retires

John A. Hammer, assistant secretary of the John Deere Plow Co., Moline, Ill., and for more than 38 years connected with that company, has resigned because of ill health. At a meeting of Deere & Co. executives at which Mr. Hammer was presented with a gold watch.

## Butler, Adams and McInnis Are Promoted by Auburn

Roy H. Faulkner, vice-president of the Auburn Automobile Co., has announced the appointments of Don W. Butler as assistant sales manager with office at Auburn and of W. L. Adams as assistant sales manager with office at Connersville. Both young men have been with the company for several years.

Mr. Faulkner also has announced the appointment of Bert McInnis, formerly service manager for Teefy-Seltz Co., Auburn distributor in Philadelphia, to the newly created position of factory supervisor of service. This work will entail introduction of factory methods of servicing cars among dealers.

## Clark is Luncheon Host

Kilburn D. Clark, eastern fleet sales representative of the Buick Motor Co., was the host last week to nearly 150 sales managers, purchasing agents and transportation experts in New York City at a luncheon at the New York Athletic Club. Following the luncheon, at which addresses were made by Mr. Clark, P. A. Dakin, assistant manager, and Arthur L. Newton, retail sales manager of the New York branch, the party visited New York headquarters where they attended a special showing of the Marquette series in the newly completed second floor showroom.

## Koubek Leaves National

J. L. Koubek, who has been associated with W. M. Johnson in automotive work, Commercial Engineering section, National Lamp Works, Cleveland, Ohio, has been named assistant to the vice-president of the Guide Motor Corp., a subsidiary of General Motors. Mr. Koubek is taking up his new duties immediately, and will be connected with the corporation's Cleveland offices.

## Hudson Names Austin

P. L. Austin has been appointed manager of the Commercial Car Division, export department, of the Hudson Motor Car Co. Mr. Austin, who will promote sales of Hudson's new light delivery vehicle, the Dover, has been an automobile dealer and a distributor.

## G.E. Elects Mosher

George F. Mosher, auditor of disbursements, was elected assistant treasurer of the General Electric Co. at a recent meeting of the board of directors of the company.

## Russell Names Gibson

The replacements department of The Russell Mfg. Co. has announced the appointment of H. L. Gibson as advertising manager.



## Austin Announces Profit of £243,025

### Statement for 15 Months Shows Decrease Despite Export Gain

LONDON, June 15—The Austin Motor Co. has reported a net profit for the 15 months ended Dec. 31, 1929, as £243,025, after deducting mortgage interest and sinking fund reserve and the allocation for income tax. This compares with £406,469 for the preceding 12 months. Out of the profit, eight and one-half years' dividends on the 7 per cent preference shares and three years' dividends on the 6 per cent B preference shares have been paid, leaving £59,664 to be carried forward. The arrears of B preference dividends still amount to £330,000. The board of directors has stated:

"Although the expenditure of £576,670 on new buildings, plant, and equipment was incurred during the period, the full benefits of this outlay will not be obtained until the current year. Substantial reductions in selling prices were made in August 1927 and August 1928, which enabled the company to hold the markets at home and abroad in face of severe competition.

"The program drawn up for 1928 was 50 per cent larger than that of the previous year, and for the first two months (October and November, 1927) this rate of turnover was accomplished in the home market, but, owing to causes outside the company's control, it could not be maintained, the increase for fifteen months being 19 per cent compared with the preceding similar period. This reduced turnover in relation to the program seriously affected the profits earned.

"The year 1928 was disappointing, and, as a proof of this, the total number of new car registrations in the United Kingdom was less than in 1927. The 19 per cent increase in our turnover should, under the circumstances, be considered as gratifying. Our export trade during the period was substantially increased. The demand for the company's products continues satisfactory."

The share capital now stands at £2,150,000 and 6½ per cent mortgage stock to the amount of £1,416,447 is outstanding.

### Mono Aircraft May Move

MOLINE, ILL., June 17—The Mono Aircraft Corp., now manufacturing from three to four planes daily, will continue production in the Velie Motors Corp. factory as soon as plant and airport facilities are available. J. A. Love, St. Louis broker, who negotiated recent purchase of the plant, has announced. When the Velie estate is settled it may be necessary to obtain new quarters, Mr. Love pointed out, but operations will not be changed from this city unless necessary.

## Financial Notes

Gramm Motors, Inc., of Delphos, Ohio, is offering to its preferred stockholders conversion privileges of five shares of no par common for one share of preferred stock. The company announces that stockholders have been taking advantage of additional no par stock at \$50 per share up to and including May 31, 1929. Dividend checks have been paid on preferred stock outstanding as of the above date for the first five months, 1929, at the rate of 7 per cent per annum. Earnings on no par have been averaging better than \$5 per share.

Universal Credit Co., which was organized for the purpose of financing exclusively the time sales of Ford products, purchased instalment contracts in excess of \$75,000,000 during its first year which was just brought to a close. The U.C.C., which has established branch offices in 21 of the country's largest cities, anticipates that the volume of business handled from now on will exceed \$25,000,000 monthly. Ultimately, service of a similar nature will be provided in all countries where Ford products are sold.

Paramount Cab Mfg. Co. has declared regular quarterly dividend of 60 cents a share, payable July 1 to stockholders of record June 21. A. S. Freed, president of the company, in announcing this dividend, stated that the company has surpassed its schedule of earnings as earlier predicted.

Thompson Products, Inc., has declared an extra dividend of 30 cents and its regular quarterly dividend of 30 cents on Class A stock, both payable July 1 to stock of record June 20. Three months ago an extra of 10 cents was declared.

Doehler Die Casting Co. has declared regular quarterly dividend of 87½ cents on 7 per cent preferred and \$1.75 on \$7 preferred, both payable July 1 to stockholders of record June 20.

American Bosch Magneto Corp. reports total assets as of March 31 of \$10,530,136 as compared with \$10,143,872 on Dec. 31, 1928. Total surplus is \$7,095,073 as against \$6,871,880.

Evans Auto Loading Co., Inc., has declared the regular quarterly dividend of 62½ cents a share on the common stock payable July 1 to stock of record June 22.

Marlin-Rockwell Corp. has declared regular quarterly dividend of 50 and an extra dividend of the same amount both payable July 1 to stockholders of record June 22.

Auburn Automobile Co. has declared regular quarterly dividend of \$1 and a stock dividend of two per cent, payable July 1 to stockholders of record June 20.

Alloy Steel, Spring & Axle Co. has declared its regular quarterly dividend of 85 cents on Class A stock, payable July 1 to stock of record June 20.

Cleveland Tractor Co. reports net earnings, after taxes, for the first five months ended May 31, 1929, of \$483,483, using preliminary figures for the month of May. This is equivalent to \$2.20 per share of common stock outstanding, and compares

with \$1.74 for the same period last year on the same basis. Sales for the first five months of 1929 showed an increase of 17 per cent over the same period last year, while the increase in net was over 22 per cent.

Jordan Motor Car Co. reports that profits for the month of May were \$20,872.62. Earnings for the past four months total \$143,403.92, while during the same four months last year Jordan showed a loss of \$355,006. According to John MacArdle, vice-president and general manager, debentures in the amount of \$1,242,000 have been exchanged for common stock in the company, representing 93 per cent of the original debenture issue.

Jordan has no bank loans and shows a profit surplus of \$981,351.05. Current assets are \$1,872,850 and current liabilities are \$320,643, giving the company a ratio of nearly six to one. May is the fourth consecutive month in which Jordan has shown a profit and according to MacArdle, June schedules call for a 21 per cent increase over May.

McQuay-Norris Mfg. Co. has decided to increase its capital stock from 100,000 shares of no par value to 150,000 shares of no par value. Stockholders of record July 1 are to be offered 10,000 shares at \$65 each, in the ratio of one share for every ten held. The remaining 40,000 shares is to be held in the treasury for disbursement as stock dividends and for other corporate purposes. It is the intention of the board to increase the dividend policy to \$2 cash on each share annually and four per cent in stock annually.

Waco Aircraft Co., recently organized to supersede Advance Aircraft Co., is making a public offering of 25,000 shares of common stock of no par value at \$23.50 a share. This does not represent new financing, as these shares have been acquired from stockholders. It is announced that the Aviation Corp. has taken a block of common stock in Waco not included in this present offering.

Fairchild Aviation Corp. reports net profit for the quarter ended March 31 of \$28,881. This is equivalent to seven cents a share on outstanding Class A stock and compares with a net loss for the year ended Dec. 31, 1928, of \$93,268.

Breeze Aircraft Corp., recently organized under the laws of Delaware to acquire the company of the same name of Oregon, is floating a block of 40,000 shares of common stock no par value. The income from this stock will be used for new financing.

Waukesha Motor Co. has declared regular quarterly dividend of 75 cents, payable July 1 to stockholders of record June 15.

Hoover Steel Ball Co. has declared its regular quarterly dividend of 30 cents, payable July 1 to common stock of record June 25.

Hoskins Mfg. Co. has declared the regular quarterly dividend of 60 cents on the common stock, payable June 30 to stock of record June 15.



## Return to "Closed Territory" Principle is Urged in Resolution of N.A.D.A.

CHICAGO, June 15—The board of directors of the National Automobile Dealers Association, at its midyear meeting in Detroit this week, adopted an official resolution urging all automobile manufacturers to return to the principle of "closed territory" in dealer contacts. This action was taken following the announcement of the National Automobile Chamber of Commerce, published in the June issue of *AUTOMOBILE TRADE JOURNAL* and *MOTOR AGE*, concerning the request made by the N.A.D.A. at the January conference for a conference committee meeting between the two organizations to discuss factory-dealer relations. The announcement of the N.A.C.C. said in part:

"While the directors recognized the importance of the suggestions presented and were anxious to be helpful in matters of interest to those who distribute as well as to those who manufacture motor vehicles, they did not feel it was within the province of a trade association of our character to attempt to determine what should be the sales policies of its members, particularly with relation to discounts and prices."

A copy of the resolution of the N.A.D.A., will be sent to the N.A.C.C. with a request that it be transmitted to all manufacturer members. A second resolution adopted was a recommendation urging manufacturers to adopt the practice of permitting dealers to take a mark-up on all cost

items in the delivery of the automobile to the customer, equivalent to the mark-up on the automobile itself.

A third resolution urged manufacturers to abandon the present practice, as it relates to discounts on fleet buyers' purchases. At present, fleet buyers are given a 10 per cent discount on their purchases.

The N.A.D.A. board recommends that instead of this 10 per cent applying to the list price of the car, that the fleet buyer be allowed a 10 per cent discount only on the net difference between list price and the trade-in value of the used car.

A fourth resolution adopted by the N.A.D.A. board was one instructing the headquarters to cooperate with local automobile dealer associations to remove from the "national advertising rate classification" that part of the automobile dealers' advertising that is purely local to the advertiser.

In a number of cities, it was explained, the newspapers are charging the national rate for local copy used by the dealer in used car advertising, service advertising, etc., as well as that advertising that is prepared by the factory and placed by the agency.

A fifth resolution directed the headquarters to make a survey of the subdealer situation in the United States and to publish a report showing the number of subdealers handling each line of cars in each of the important distributing centers of the United States.

## Plans Are in Progress to Expand Polish Firm

WASHINGTON, June 20—Negotiations are in progress between the National Economic Bank of Poland and a group of Italian industrialists, looking toward an increase of the capital stock of the Ursus Automobile Co., according to a Warsaw report received this week by the Department of Commerce.

It is reported that the Italian group will subscribe to a new issue of stock, which will represent 40 per cent of the entire capital of the company so that the control of the company's affairs will remain in the hands of the bank. The proceeds will be used to enlarge the company's plant and increase production, it was stated.

## British Makers Revise Size Markings of Tires

LONDON, June 10—The Standards Committee of the British Society of Motor Manufacturers has adopted a new series of size markings for the wired-edge (drop center) type of pneumatic tire for passenger cars, trucks and buses. The new marking or designation takes account only of the nominal sectional dimension and the

rim diameter, both in inches. Moreover, progression in sectional sizes by  $\frac{1}{2}$  in. is aimed at, though for present requirements it has been considered necessary to include the existing 4.75 and 5.25 sections.

Such fractions as 4.40, 4.95, 5.77 and 6.20, some of which have applied to sizes in widespread use, are held unnecessary and are eliminated. Subsidiary markings, giving the former designation in smaller figures than the new ones, will be included, however, until the new markings have become familiar to users.

## Cincinnati Advertisers Addressed by E. B. Neil

PHILADELPHIA, June 17—At a meeting of the Cincinnati Association of Industrial Advertisers held in the Chamber of Commerce Building at Cincinnati recently, Edmund B. Neil, research engineer of *Automotive Industries*, spoke on "How the Engineer Looks at Industrial Advertising." After first stating that the engineer reacts to emotional appeal just as does the layman and is susceptible to the same appeals in advertising, he indicated that, because of the engineer's method of analytical treatment of problems in

his own field, considerable of the value of this appeal was lost by following it with too much "bunk."

At the meeting the following officers of the association were elected for the coming year: Henry G. Roos, president and treasurer of the H. W. Roos Co., president; Fred C. Berling of the Lunkenheimer, vice-president, and W. J. Hengehold of Lodge & Shipley, secretary and treasurer.

## Chrysler Plant on Coast to Go to Oakland, Cal.

OAKLAND, CAL., June 18—Definite announcement that the \$3,000,000 assembling plant of the Chrysler Corp., sought for many months by several Pacific Coast cities, is coming Oakland, has been made by the Chamber of Commerce here.

The announcement is based on an advertisement of Oakland and the Chrysler company, prepared by the Chamber of Commerce and the automobile company, to appear in six national magazines in July. A paragraph in that part of the advertisement prepared by the Chrysler company reads:

"Chrysler Motors has bought a 51-acre tract in Oakland for a western plant which is soon to rise among the other great industrial establishments in Oakland's manufacturing district."

A letter from the company to the Chamber of Commerce discusses plans for the new plant. The site here was purchased a considerable time ago, but thereafter Los Angeles and other cities made strong bids for the factory.

## Pitcairn Aviation Stock Purchased by C. M. Keys

NEW YORK, June 17—C. M. Keys, head of the Curtiss group of airplane companies, has purchased the entire capital stock of Pitcairn Aviation, Inc., operating air mail lines between Newark, N. J., and Miami, Fla., by way of Philadelphia, Baltimore, Washington, Richmond, Atlanta and Jacksonville.

Pitcairn is equipped with planes constructed by the manufacturing interests of Harold L. Pitcairn, former owner of Pitcairn Aviation, and with Ford trimotored planes. The Pitcairn interests will concentrate on the manufacture of planes, devoting special attention to their own development of the autogiro. The price paid for the stock was not disclosed.

## Sales Gain 29 Per Cent

PHILADELPHIA, June 17—The total of new car sales for the month of May in eight widely scattered states and the District of Columbia was 52,722, as compared with 40,833 for May, 1928, showing a gain of 29 per cent. The May, 1929, figures for the separate states follow: Rhode Island, 3029; Delaware, 998; South Dakota, 3114; South Carolina, 2959; Maryland, 5099; District of Columbia, 2424; Illinois, 28,774; North Dakota, 3765; Utah, 2560.



## Members of O.A.C. Discuss Markets

### Developing New Export Fields is Subject at Season's Last Meeting

NEW YORK, June 17—Members of the Overseas Automotive Club discussed new markets at their final meeting this season, held at the Hotel Astor a few days ago. Cecil M. Peter, export manager of the Black & Decker Mfg. Co., and a director of the club, explained his company's efforts in developing a number of small, or comparatively small, new export markets. He pointed out that such markets in the aggregate account for considerable annual volume.

One of the most valuable aids in working up such territory, Mr. Peter said, was to get jobbers to visit the plant. He pointed out that trade paper service and information from the Department of Commerce also was of considerable assistance. Among some of the markets in which Black & Decker has recently been doing aggressive work, not all of which are either new or small, are Russia, Japan, Malay States, French Africa, Portugal and Iceland.

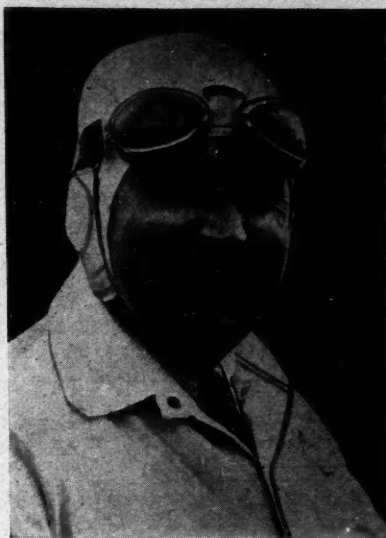
John Schlegel, export manager of Fairchild Airplane Mfg. Co., spoke of the markets which are being created abroad for engines and replacements of American manufactured airplanes. He pointed out the rapid growth of the export business in American airplanes, engines and accessories, which attained a volume in 1928 of \$3,665,000. Of this amount, \$1,254,000 was for replacements and spares. This branch of the business will probably attain a volume of between \$3,500,000 and \$4,000,000 this year, according to Mr. Schlegel.

Roger Bracken, export manager of Millers Falls Co., described conditions as he found them on a recent trip through Hawaii, Japan, Korea, Manchuria, China and the Philippines. In Hawaii, he said, there is an active market for accessories due to the great volume of used cars in that market. Reconstruction in Japan has been rapid and most of the leading cities are again completely rebuilt. He pointed out that this country, however, is still lacking in good interurban motor roads.

### New Method for Gasoline is Discovered by Bureau

WASHINGTON, June 20—Scientists at the Bureau of Standards have discovered a new process of gasoline extraction from natural gas which is of importance to both the gasoline industry and the motorists, Secretary of Commerce Robert P. Lamont announced this week.

"The method," Secretary Lamont explained, "employs what is known as an isothermal distillation of the natural



Ray Keech

## Ray Keech Buried at Coatesville, Pa.

COATESVILLE, PA., June 18—Ray Keech, winner of the Indianapolis Speedway Race, May 30, and former holder of the world's mile speed record for automobiles, was buried here today. He was killed as the result of a crash at the Tipton Bowl (Altoona, Pa.) on June 15.

After a short but spectacular career on dirt tracks Keech, who began life as a truck driver, flashed into fame on the Daytona Beach track by beating Capt. Malcolm Campbell's record of 206.95 m.p.h., with J. M. White's 36-cylinder "Triplex," which he drove at an average speed of 207.55 m.p.h. for the measured mile. This record was made April 22, 1928, and held until March 11, 1929, when it was beaten by Major H. O. D. Segrave, in the "Golden Arrow."

gas mixture, a process just the reverse from the ordinary distillation as it is conducted at a constant temperature with pressure varying. It also includes a system of recombining the various fractions with measurements of their saturation pressures. It is accurate to within 10 gal. of condensate per million cubic feet of gas."

### Checker Cab Gaining

NEW YORK, June 14—Checker Cab Mfg. Co. is running 30 per cent ahead of its scheduled production of 1929, according to Morris Markin, president. The original program called for 7500 units, but unfilled orders now on hand will take care of the entire production until about September 30, according to Mr. Markin's statement.

### Seat Covers Announced

DETROIT, June 17—Cadillac-LaSalle dealers are now offering seat covers in a wide variety of styles for Cadillac and LaSalle cars.

## Swayne Explains Factors of Safety

### Cites Improvements in Steering Acceleration and Shock Absorption

NEW YORK, June 18—Three advances in automobile construction in very recent years have contributed to greater safety, Alfred H. Swayne, vice-president of General Motors Corp., said in one of a series of safety addresses broadcast from WEA and 33 associated national broadcasting stations, under the sponsorship of the National Safety Council.

The first of these is the improved steering mechanism which enables anybody to make a quick turn with a minimum of effort, Mr. Swayne said. The second is the improvement in shock absorbers, tires and springs which have reduced to a very marked extent the amount of fatigue involved in driving and thus has reduced the accompanying hazard, and the third and most important, in Mr. Swayne's opinion, is the improvement in acceleration of all speeds.

This last factor has made it less urgent for higher priced cars to try to pass lower priced cars on hills and also has made much safer the policy of passing cars on four-lane highways with less danger through inability to put on the right speed at the right time. Mr. Swayne also pointed out the need of proper maintenance in keeping the car in condition in order to attain a maximum safety in highway operation.

## Great Lakes Aircraft Enters No. 1 in Tour

DETROIT, June 18—The Great Lakes Aircraft Corp. of Cleveland has sent in entry No. 1 for the 1929 National Air Tour, which will be held Oct. 5 to Oct. 21, according to Col. Benjamin F. Castle, president. This ship, a new type soon to be announced, has been assigned No. 1 by the National Air Tour Committee.

Charles W. Meyers, chief test pilot of the corporation, will fly the ship. Other corporation ships will accompany the leading plane, including the Trainer and the 4A-1 amphibian, Col. Castle stated. The tour will cover approximately 3900 miles.

Deliveries of Great Lakes Aircraft Corp. Trainers are now being made, with 25 ships scheduled for delivery by the end of June and 78 during July.

## Perfect Circle Output High

HAGERSTOWN, IND., June 15—During the first four months of 1929, the Perfect Circle Co. produced 17,141,200 piston rings. One shipment consigned to Chanslor & Lyon Stores, Inc., San Francisco, contained three car loads, it was announced by the Perfect Circle Co.



## Revision of Rates Seen by N.A.C.C.

DETROIT, June 15—At the meeting of traffic managers representing members of the National Automobile Chamber of Commerce, held here this week, it was reported that the work of entirely revising all class rates in the territory east of Chicago, which has been progressing with the Interstate Commerce Commission during the past several years, is to be concluded with three days of oral argument before the Commission July 15, 16 and 17.

Final decision by the Commission is expected shortly thereafter, and according to preliminary forecasts most of the class rates between every point in the territory will be changed, with increases falling particularly on articles in the higher classes.

As part of the general rate study being conducted by the Chamber, it was decided to gather specific data relating to shipments on iron and steel parts and materials, of which the industry is a heavy consumer, and in this the large steel producers, of whom eleven were represented at the meeting, are to assist.

## Caterpillar to Build

OAKLAND, CAL., June 17—The Caterpillar Tractor Co. has announced that it will build a \$25,000 addition to its manufacturing plant at San Leandro, a suburb of Oakland. News of the extension came with the issuance of a building permit in that amount by the San Leandro authorities. Work on the addition is to start at once. The structure will be 300 by 100 ft. in size and will be used as part of the concern's machine shops. The \$50,000

## Meeting is Planned by Road Congresses

WASHINGTON, June 20—The Permanent International Association of Road Congresses, the only world-wide official organization of highway authorities, will hold its sixth session here during the second week of October, 1930, it was announced this week.

building, begun several months ago to provide additional room for the company's general offices, will be completed early in July, it is announced.

## Guggenheim Tests Start

NEW YORK, June 18—Flight tests of the entries in the international safe aircraft competition sponsored by the Daniel Guggenheim Fund for the Promotion of Aeronautics, started this week at Mitchell Field, L. I. To date there are twelve entries from manufacturers for the prizes of \$150,000 offered by the fund for aircraft demonstrating the greatest advance in aerodynamic safety without loss of efficiency. Six of these are from the United States, five from England and one from Italy.

## Union Carbide Building

NEW YORK, June 8—Union Carbide Co. has announced the erection of its new research building at Niagara Falls. This building is being built entirely by oxy-acetylene welding of the 300 tons of structural steel required for its framework.

## Houdaille-Hershey to Enlarge Plant

DETROIT, June 18—Houdaille-Hershey Corp., owing to increased business during the past five months, has been required to expand its manufacturing facilities and equipment of the Houdaille plant at Buffalo, N. Y., on a large scale, according to Claire L. Barnes, president. These additions will be paid for out of earnings as the company at present is in a strong cash position.

Houdaille-Hershey operates plants in Chicago, Buffalo, Detroit and Indianapolis. Every automobile manufacturer in the United States uses one or more Houdaille-Hershey corporation's products.

Recently the Houdaille-Hershey corporation offered to exchange its stock share for share for stock of the General Spring Bumper Corp., of which Mr. Barnes is also president. Under the provisions of this offer, stockholders of the General Spring Bumper Corp. are requested to deposit their shares for exchange before July 1, 1929. At least 75 per cent of the General Spring Bumper capital stock must be deposited by that date.

## N. C. Sales Up

RALEIGH, N. C., June 15—Approximately one-third more automobiles have been sold in North Carolina so far this year than were sold in the same period last year. Forty-two per cent of those sold this year were paid for in cash at the time of purchase, while only 28 per cent of those sold last year were paid for when purchased.

# Calendar of Coming Events

## SHOWS

International Aircraft Exhibition, Olympia, London ..... July 16-27  
International Aircraft Exhibit, Coliseum, Chicago ..... Sept. 7-15  
National Machine Tool Builders' Exposition and Congress, Cleveland, Sept. 30-Oct. 4  
Paris, Automobiles ..... Oct. 3-13  
London, Automobiles ..... Oct. 17-26  
Prague, Automobiles ..... Oct. 23-30  
Paris, Motorcycles ..... Oct. 23-Nov. 3  
M.&A.E. Show and Convention, Chicago ..... Nov. 4-9  
N.S.P.A. Show and Convention, Detroit ..... Nov. 11-16  
Berlin Auto Salon ..... Nov. 14  
London, Trucks ..... Nov. 7-16  
Paris, Trucks ..... Nov. 14-24  
London, Motorcycles ..... Nov. 30-Dec. 7  
Brussels Auto Salon ..... Dec. 7  
New York National ..... Jan. 4-11  
Chicago National, Coliseum ..... Jan. 25-Feb. 1

## CONVENTIONS

Joint Meeting, Oil and Gas Power Division of the American Society of Mechanical Engineers and Pennsylvania State College, Pa. .... June 24-27  
National Association of Credit Men, Minneapolis ..... June 24-29  
American Society Testing Materials, Annual Meeting, Atlantic City, June 24-28

Motor Bus Division, A.A.A., Third Annual Meeting, Buffalo ..... July 1-2  
American Automobile Association, Buffalo ..... July 1-2  
International Chamber of Commerce, Fifth Congress, Amsterdam ..... July 8-13  
National Association of Show and Association Managers, Meeting, Chicago ..... July 25-26  
American Welding Society, Fall Meeting and Exposition, Cleveland ..... Sept. 9-12  
American Institute of Mining and Metallurgical Engineers, Cleveland, Sept. 9-13  
American Society for Steel Treating, Convention and Exposition, Cleveland ..... Sept. 9-13  
American Chemical Society, Fall Meeting, Minneapolis ..... Sept. 9-13  
A.S.M.E.—Iron and Steel Division—National Meeting, Cleveland ..... Sept. 11-13  
Society for Electrical Development, New York City ..... Sept. 13  
Eastern States Exposition, Springfield, Mass. .... Sept. 15-21  
American Electric Railway Association, Atlantic City ..... Sept. 23-Oct. 4  
National Safety Congress, Annual, Chicago ..... Sept. 30-Oct. 4  
Penna. Automotive Association, Erie, Pa. .... Oct. 7-8  
Permanent International Association of Road Congresses, Sixth Session, Washington, D. C. .... Oct. 7-11  
Society of Industrial Engineers, Detroit ..... Oct. 16-18  
World Engineering Congress, Tokio, Japan ..... Oct. 29-Nov. 22

National Automobile Dealers Association, New York City ..... Jan. 6  
National Automotive Dealers Association, Chicago ..... Jan. 27-28

## RACES

Salem, N. H. .... June 29  
French Grand Prix ..... June 30  
Spanish Grand Prix ..... July 31  
British Tourist Trophy Race ..... Aug. 17  
Akron ..... Aug. 18  
National Air Races and Show, Cleveland, Aug. 24-Sept. 2  
European Grand Prix, Italy ..... Sept. 8  
Syracuse ..... Sept. 8  
Altoona, Pa. .... Sept. 2  
Cleveland ..... Sept. 12  
Salem, N. H. .... Oct. 12

## S. A. E.

Summer Meeting, Saranac Lake ..... June 25-28  
Aeronautic Meeting, Cleveland ..... Aug. 26-28  
Production Meeting, Cleveland ..... Oct. 2-4  
Annual Meeting, Detroit ..... Jan. 21-24

## SALONS

Hotel Drake, Chicago ..... Nov. 9-16  
Hotel Commodore, New York City ..... Dec. 1-7  
Hotel Biltmore, Los Angeles ..... Feb. 8-15  
Palace Hotel, San Francisco, Feb. 22-Mar. 1